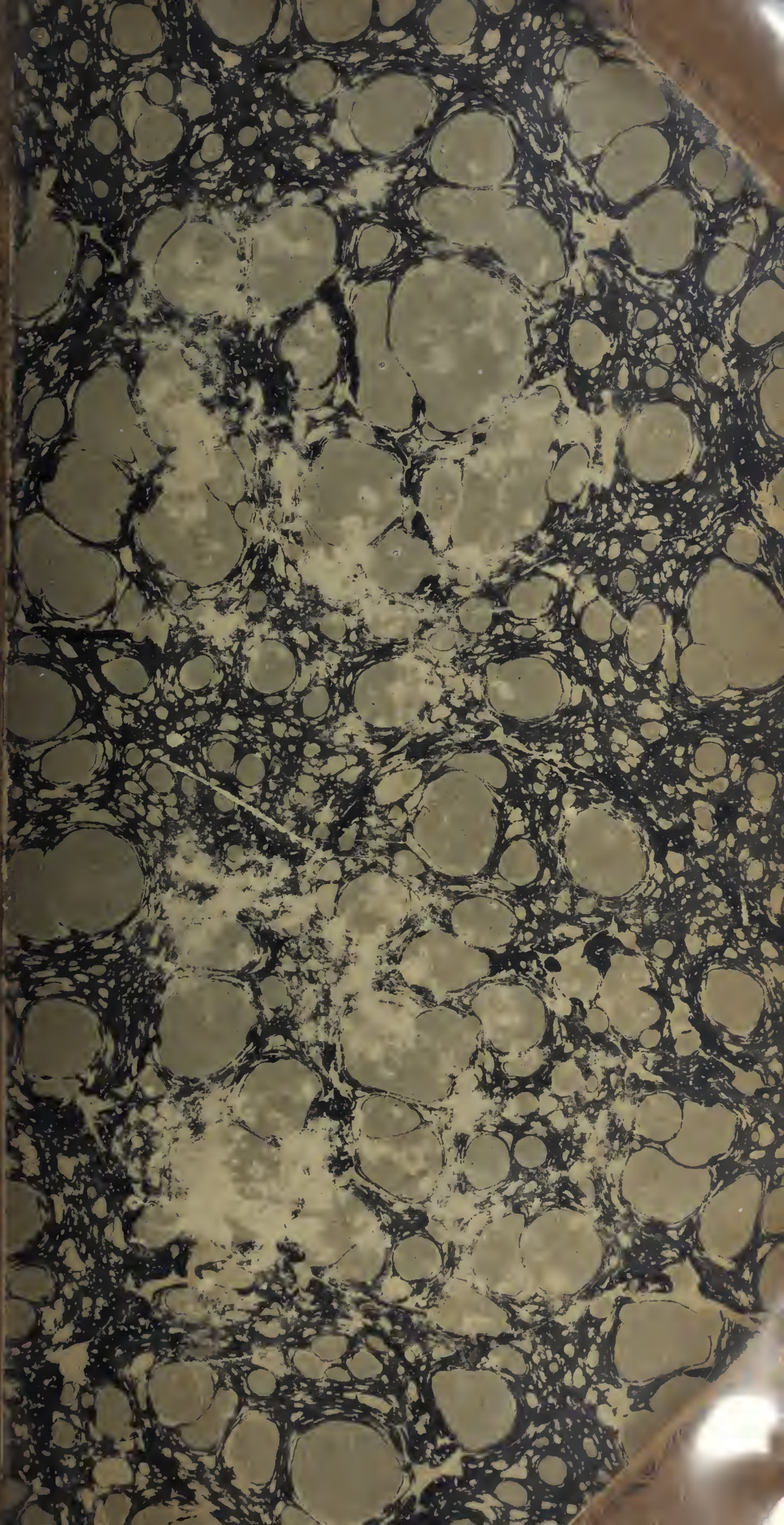

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THE

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FOR 1862.

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Communications and Cases.

ON MELANOSIS.

By Assist.-Professor Varnell, Royal Veterinary College.

Melanotic deposits are by no means rare in the horse. There is scarcely an organ in the body of this animal in which I have not seen this pigment deposited in its tissues; and although many cases are recorded in the pages of the *Veterinarian*, and other veterinary works, yet I am not aware that the pathology of this disease has been freely discussed, or its varieties investigated with a view to a systematic classification; and until this is done, we shall always be in danger of confounding simple melanosis, which is by far the most common in the horse, with that of a malignant character.

The former, unless the deposit is excessive, and an important organ involved, is comparatively harmless, while the latter is highly injurious. A clear insight into the histology of such abnormities requires the aid of the microscope for their elucidation, and he who undertakes it will be amply repaid for his trouble by the benefit he confers on the members of the profession. Cases from which specimens can be obtained for examination are comparatively numerous, therefore on that score we have no excuse.

For the assistance of those who may be desirous of contributing to veterinary pathology the results of their investigation of this disease, I have thought the following cases worth recording, since with others already published they may serve as data on which their conclusions may be based.

The first was forwarded to me by Mr. H. W. Hooper,

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M.R.C.V.S., Cheltenham, accompanied with the following letter:

CHELTENHAM, *November* 14*th*, 1861.

DEAR VARNELL,—I have forwarded by Great Western Railway a morbid specimen, consisting of an hypertrophied spleen, with melanotic tumours of various dimensions on it. The subject of this malady was a well-bred gray gelding, about twenty years old, which I have known for several years as a brougham-horse, and upon whom I operated about two years since in removing a melanotic tumour adherent to the depressor muscles of the coccygis, opposite to the anus. It weighed nine ounces, and the animal has continued to work ever since, up to within a fortnight of the present date, always being in excellent condition, and maintaining his animated spirits, when he suddenly became emaciated. Being called in, after an examination I apprehended the existence of melanotic tumours internally, and, considering the case was a hopeless one, I recommended him to be destroyed.

I would make one remark regarding the presence of these tumours. The subjects of them I have generally found keep up their condition, but that the disease should have gone on to such an extraordinary degree in the present instance, until so recently, and the general health of the patient not to be impaired by it, seems something wonderful to me.

If, on examination of the parts, you think there is anything singular in this case, I shall be glad to peruse your remarks in our professional journal, or otherwise.

I remain,
Yours very truly.

The next case that came under my notice was similar in its nature to the above, and was forwarded to Professor Spooner, who, in one of his lectures, explained his views of the case to the class. This extraordinary specimen was sent by Mr. Jones, M.R.C.V.S., of Worship Street. The animal dropped down while at his ordinary work, in the Victoria Docks, and died soon after. Melanotic tumours had existed on the tail for several years, and the spleen was found diseased, like that communicated by Mr. Hooper.

The other case was sent a short time since to *the Editors of the Veterinarian,* accompanied with the morbid parts:

KINGSTON, YEOVIL, *Wednesday, Nov.* 27*th*, 1861.

GENTLEMEN,—By train this day you will receive a part of a lung belonging to a thorough-bred gray mare. She had never been decidedly ill, but for the last two or three months had been "off her feed" to a great extent; until at length she presented a most emaciated appearance.

She was the property of a commercial gentleman, and was sent to me about a week ago. Her pulse and breathing were natural, but she frequently moaned. The breath was fœtid. Some *incipient* melanotic tumours also existed under the tail and about the perinæum.

During the week I had the care of her her appetite gradually improved, her spirits became more cheerful, and she sometimes even ate with avidity. I gave her repeated small doses of arsenic, but on Sunday last she got down, was unable to rise again, and died in the night. On opening her the following day, I found nearly three fourths of the left lung a completely blackened

mass, resembling the portion I have sent you. Black matter of the same character was also adhering to the ribs—both the true and false. The other lung and the heart were healthy. A number of black tubercles existed in the mesentery, but the liver, spleen, and all the other abdominal organs were healthy.

Believe me, gentlemen,
Your obedient servant,
CHARLES M. BLAKE, M.R.C.V.S.

The *spleen* sent by Mr. Hooper was simply examined by me with reference to its form, weight, and general appearance, as far as the unaided eye could observe. In colour, it was a dark gray, and much darker in some parts than in others. Its surface was irregularly nodulated, the nodules varying from the size of a walnut to that of a man's fist, the extreme summits of these enlargements being much darker than any other part of the organ. Its weight was forty-seven pounds, which, although very large, it is exceeded by one, the cast of which is in the College Museum. I have no doubt but the one sent by Mr. Jones was also heavier, but unfortunately it was not weighed.

In making a section through the centre of the spleen, the cut surfaces presented a somewhat varied aspect. In those parts unaffected by the presence of pigment, or but very slightly involved, it was of a dark reddish-brown colour, slightly striated by the white edges of the cut trabiculæ. It was also thinly speckled with very small Malpighian bodies. Where the section passed through the centre of the enlargements, it presented a blackish slate colour, crossed here and there with a few fine white lines. Its capsule, and peritoneal coverings, varied in thickness. In no part were they thicker than natural, but where they covered the upper portion of the tumour they were unusually thin. This brief description equally applies to both spleens, for the morbid alteration which had taken place in the structure of the one sent by Mr. Jones, appeared to be identical with that observed in Mr. Hooper's case.

With reference to Mr. Blake's case I cannot think, nor do I suppose he thought, that the melanotic tumours which he mentions as being situated under the tail of the animal, were of themselves sufficient for him to conclude that others existed to any great extent in the lungs, or that her illness depended upon their presence; he therefore treated the mare in accordance with the symptoms he observed. Had he been able to diagnose the case, which I believe could not have been done, he would, as a matter of course, have ordered the mare to be destroyed in the first instance.

ON INDIAN HEMP,

AS A REMEDY IN TETANUS AND PARALYSIS, AND AN ANODYNE—TREATMENT OF LAMINITIS—INJURIES FROM CASTING OF HORSES—STRANGULATED SCROTAL HERNIA—BURSAUTTEE—PARALYSIS OF THE PENIS—CASE OF IMPACTED ŒSOPHAGUS—EPISTAXIS—DRAINAGE OF CAVALRY STABLES—EPIZOOTIC TYPHUS FEVER—CANKER—CATTLE DISEASES.

By J. R. Hoey, M.R.C.V.S.,
V.S. Her Majesty's 3rd Brigade Horse Artillery, India.

To the Editors of 'The Veterinarian.'

Dear Sirs,—Seeing that twenty years have elapsed since I made any communications to you for publication, I think I may with safety expect to escape being charged with "cacoethes scribendi."

Being now absent on leave for a short period, I am compelled to recite the few cases now given from memory, having no register by me for reference as to dates, &c. However, I give them in the "rough," in the hope that they may prove useful as guides in some measure, and that they may prove acceptable for publication in *The Veterinarian*. Of course, there are some cases here described that are occasionally occurring in the practice of all veterinary surgeons in India and elsewhere, and consequently nothing novel in some of them; but others are not so, and these at least may prove beneficial to the profession at large, in eliciting remarks from them for the general good. The position I am placed in must necessarily confine me to cursory observations, which, though unavoidable, is to be regretted.

It has long been a desideratum, that, if not a specific, at least some valuable therapeutic could be relied on in that fearful disease tetanus, and I am not aware that any veterinary surgeon has heretofore written on the subject of hemp (*cannabis Indica*) as a cure for tetanus. In this country the native name for hemp is "Bhung." Its properties as a powerful narcotic all are acquainted with, and I now propose it as the most reliable agent, if not specific, in tetanus, to the expulsion of opium in the treatment of that fearful and formidable disease.

The case I am about to relate, Colonel Horsmonden Baldwin, late of the Bengal Horse Artillery, now in England,

will doubtless recollect to have occurred at Meerutt, in his troop:—A chesnut Caubul horse was seized, and brought to the infirmary, with all the symptoms of approaching tetanus. He had been, if memory fails me not, shod a day or two before, though no wound could be discovered to constitute it a decided case of traumatic tetanus. Immediately after admission, however, symptoms of this disease of the most aggravated and violent form set in, and ended in confirmed tetanus, under which the animal laboured for several days. At every exacerbation, and increased by approaching the animal, his situation became fearful to contemplate, during which period the jaw was firmly locked and immoveable, so much so that a straw could not be got between his teeth for five consecutive days. On admission, the usual depletory measures had been adopted, and now came the trial of the "bhung;" but how to administer it was the difficulty, as the jaw was immoveable. A quantity of fresh green hemp was procured, which, when pounded, was made into a decoction as follows:—To four chittacks* of the pounded leaf add four quarts of water, boil down to two quarts, and strain. This quantity to be divided into three doses, and given as a drench, morning, noon, and night. The drench was administered through the nostrils, by means of the common pewter enema syringe, and sustenance given per anum. At the end of five days the jaw gradually relaxed, and a perfect cure tardily succeeded. The horse was much debilitated, and consequently very weak for some time after, but eventually, under a tonic regimen, he returned to duty thoroughly cured, and performed his duty in the guns as efficiently as ever he had done before.

A case previous to this, of traumatic tetanus, had been admitted, from a prick in the foot, and the animal died in three or four days from the date of admission. Another—an officer's charger under treatment for a corn, running into canker—after all mild measures had failed, the foot was dressed with nitric acid; tetanus immediately supervened, and the horse died in less than forty-eight hours.

If I recollect right it was such cases as these that determined me to try the "bhung" in the case of the chesnut Caubul horse, and the result is before you.

The grand desideratum in bhung is, that while it is an all-potent narcotic it does not in the least produce constipation, or apparently alter the secretions in any way.

I am now going to "blow hot and blow cold," and you will think it strange that this bhung should prove so highly effi-

* A chittack is two ounces English.

cacious in another disease; but so it is, and its *modus operandi* I am content to leave to your superior judgment. I was called in by Captain Robert Wigram Clifford, of the Bengal Cavalry, to see a horse suffering from partial paralysis. The animal had made a long journey in extremely rough and wet weather, and was put into a leaky stable, the water dripping on his back. When I saw the animal he was unable to stand straight, and was leaning with his quarters against the wall, supporting himself thereby. This was a case that, in India, has obtained the name of "kumree," or stroke of the wind. Being then in the hills, and having no medicines with me, I prescribed a dose of physic, followed by the application of a powerful mustard embrocation over the loins, after fomentations, and a fresh sheepskin over all, and strongly advised Captain Clifford, after the operation of the medicine had ceased, to exhibit the "bhung." He was very careful in following my directions, and the bhung was exhibited in the doses prescribed for the tetanic case, and Captain Clifford's words were to me,—"I never saw such a thing in all my life, Hoey,—it was magic, and you ought to report the action of this invaluable remedy for the benefit of the world at large." After the bhung had been persevered in for a few days in this case, a perfect cure was the result.

In another case a troop-horse was admitted into hospital, lame with large ringbone near behind. He had had this enlargement for a long time previous to admission, and had never gone lame before. After the ordinary mild remedial measures had been adopted, and all heat, tenderness, and pain had subsided, he was blistered. The result was freedom from excessive lameness, but engorgement of the surrounding parts, which in a measure gradually fined down, as is usual in such cases. Some time after this, the animal being still in hospital, although convalescent, was suddenly seized with paralysis. A swelling appeared among the muscles of the loins, immediately behind the right kidney, with slight fever. This was combated by fomentations and a mild aperient, followed by simple febrifuge medicines; but, strange to say, though the swelling was reduced by the treatment adopted, the paraplegia remained. The animal was down, and an attempt was made to put him on his legs by eight or ten men, to see what power he had, but he had none, and was therefore let down again. A pin was stuck into his hind quarters and legs in various places, of which he was perfectly unconscious. The seat of ringbone was then repeatedly struck, but of this he appeared also perfectly unconscious. No fæces were voided, but the urine dribbled away involun-

tarily, being of a muco-albuminous character. I examined the bladder per rectum for stone, but found none. The animal falling away in flesh, the system was supported by a more nutritious diet;—the febrifuge balls, combined with catechu, were continued, occasional enemata were thrown up, and a strong embrocation of turpentine and ammonia briskly applied over the loins and thighs. The bhung in decoction was now given alternately with the febrifuge three times a day, and in eight or ten days from this time the animal began to amend, and gradually to recover sensation and power in his extremities; also the action of the sphincter of the bladder returned, the urine ceased to dribble, and the functions of the abdominal viscera became normal. Eventually this resulted in perfect restoration to health and power, after a course of tonics, vegetable and mineral, the latter being exhibited in his water as a chalybeate, added to a nutritious diet. The animal was now returned to duty cured.

In another instance I had a valuable Arab, worth £140, the property of Captain Higgins, 3rd regiment of infantry, under treatment for a very severe injury of the shoulder-joint. It appeared on admission to be almost a hopeless case, but by repeated blistering, after other remedial measures, the case yielded to treatment, and the animal became perfectly sound. He was now ready to be discharged, when, by some negligence on the part of the syce (groom) he fell back in his stall. I was sent for by the farrier-major suddenly, and found the animal tolerably quiet in his stall, but observed tenderness on pressure to exist over the lumbar region of the spinal column. On leading him out, he immediately became spasmodically convulsed, staggering as though he would fall, and that all to one side; the muscles of the right side of the neck were spasmodically constricted to the fixing of the head rigidly drawn towards the same side. On returning to his stall this action ceased, but the moment he was moved it returned. This was a pure case of arachnitis spinalis, I fancy. An active aperient was given, the loins fomented, a strong liniment rubbed in, and a fresh sheepskin applied over all. The bhung was now administered, exactly in the same doses as in the tetanic case, and in a few days the animal was quite well, and sent off on a march to the hills to his master, and I have never seen or heard anything of him since. Thus much for the action of hemp (*bhung*). Any further results, together with its peculiar action on the animal economy, I leave to my professional brethren, feeling assured that, if they will give it a fair trial, their most san-

guine expectations will be more than realised, where the use of a powerful narcotic is indicated. Its peculiar action in cases of tetanus and paralysis, as I said before, I leave to you, gentlemen, to offer an explanation and opinion on, and shall feel obliged for any editorial remarks you may be pleased to make on its duplex action, if I may so name it. "Facts are stubborn things," and I simply narrate what has occurred in my practice.

The next case is of another class. The surgeon of my corps sent me a valuable Arab, the property of Colonel Innes, of the 61st regiment, which, though the distance was short, could scarcely crawl to my hospital. The animal had been ridden hard into cantonments, over a road as hard as adamant, and that for thirty miles. The result was laminitis in a severe form. The treatment I adopt and find most successful is that recommended by Mr. Gabriel some time since. The animal was bled largely, and a large dose of physic administered. He was then cast, setoned, and the bleeding feet immersed in large warm poultices. All febrile symptoms were combated with simple febrifuge medicines combined with anodynes, and the result was "resolution," and eventually a perfect cure.

Where a narcotic is indicated, I would recommend even in these cases "bhung," instead of either opium or belladonna, and I hope ere long to see an extract of hemp in general use in all such cases, though I almost fear it would deteriorate in its properties in the form of an extract, as hyosciamus does in this country of severe extremes, and thus by not equalling the fresh and green leaf in its powers, would thus, in many cases, disappoint the hopes of the practitioner; however experience, as in all other cases, will eventually settle this point. It is to be lamented that the nature of our patient is such, that we have to cast in the generality of our operations; but over a practice of nearly twenty-four years I have fortunately met with but two accidents. In both cases the animal was well thrown and secured. One was for firing for old injuries of the flexor tendons, and the other for castration. The first, an animal six years old, and peculiarly thin skinned, struggled so violently the moment the iron was laid on, that, without my knowledge, he injured his spine. He remained quiescent after this throughout the operation, but when freed from the hobbles he could not rise; perfect paraplegia had taken place, and he was shot by order. This was a case where I would now give the hemp a fair, full, and perfect trial. The second case, the animal was also properly thrown and secured

for castration; but the moment the knife was applied to the scrotum he straightened the leg, already drawn forward and secured, with such intense power, that a report was heard like the crack of a rifle: he had fractured his femur obliquely. He was immediately loosed from the hobbles and shot by order. I merely mention these two cases as a warning to young practitioners, and to show what difficulties and dangers we have to contend with; and though in a practice of twenty-four years I have had but these two cases, had they occurred in *private* practice the owner perhaps would have shot me instead of the horse; and yet we all know that, we never cast a horse that we are not in imminent danger of the same result. I have deviated a little perhaps from the regular course of correspondence in mentioning these two cases *en passant.* (*To be continued.*)

[We thank Mr. Hoey for his long and interesting communication, which press of matter compels us to divide.

We have tried the extract of Indian hemp, but it fails in England to produce the effect known to follow its exhibition in India. The late Mr. Hughes, of Calcutta, found it to be as effective in that country as Mr. Hoey has done, and we were very sanguine in our expectations as to the result when a quantity of the extract was sent to us for trial. Mr. Hoey is therefore right in his conjecture, that it becomes deteriorated in its properties by some means or the other.

Dr. O'Shaughnessy describes three different preparations from the hemp:

1. *Churrus,* the concreted resinous exudation from the leaves, stems, and stalks of the plant.

2. *Gaujak,* the dried hemp-plant that has flowered, and tied up in bundles containing twenty-four plants.

3. *Bang, sudjee or sidhee,* formed of the larger leaves and capsules without the stalks.

Dr. Pereira was among the first, Dr. Royle states, to submit this drug to experiment, but failed in obtaining any results, probably from changes having taken place in it. Dr. Laurie also pronounced it uncertain, and not to be depended on as a narcotic. But there are others who speak highly of it as an agent for controlling inordinate spasm and intense neuralgic pain. Experiments are wanting in this country to prove its efficacy as a therapeutic.

In the present number will be found an extracted article on this subject.

We perceive that Dr. Turnbull, of Liverpool, has lately advocated the use of sulphate of aniline, an artificial alkaloid,

as an anodyne in spasmodic muscular action. He states it to act directly on the nervous system, and believes it to be a valuable agent.

Mr. Hoey is informed that the College confers no honorary distinctions. The Fellowship he refers to is connected with the *Veterinary Medical Association*, and he has a right to use it as he pleases.]

THOUGHTS ON HYDROTHORAX.

By Thos. Greaves, M.R.C.V.S., Manchester.

The end and aim of veterinary science is to alleviate suffering and preserve life. With the object of humbly contributing to that end, I take up my pen in the present instance.

I have had my attention called to the subject of hydrothorax lately, to a degree that has excited more than ordinary thought, from having attended no less than twelve cases within the past two years, ending February last. Seven of them were my own patients, and five were under other practitioners, to which I was called in consultation. Six of these cases were operated on, and large quantities of water taken away in each instance. Only two out of the twelve recovered, and these were not operated on. Three of the others had been bled, and all of them died. Except one, every patient was freely stimulated over the sides, and several of them also along the throat and breast; they were likewise setoned or roweled. Various therapeutics were administered. They were all young and good cart-horses, and for the most part partook of an asthenic or typhoid character, pleurisy and pleuritic symptoms predominating. One of the two that recovered was in a most critical state for two months; his breathing was very much accelerated, and the pulse continued from 80 to 96 for three weeks, despite very large doses of sedatives, &c. I attribute his ultimate recovery to tenacity of life, a strong sound constitution well supported, and "last not least," to clipping all over; for from that moment his restoration to health was marked. In six months after his recovery—he having been working and got quite fat in the meantime—he received a very severe injury on the foot, causing a deep sloughing lesion and open joint, from the effects of which he died. I had then an opportunity to examine his chest, and found there was no disease whatever either in the pleuræ or the lungs.

The post-mortem examination of the cases that died showed the usual pathological appearances; namely, the cavity of the chest full of water, generally on both sides, but in several only on one side, with quantities of lymph floating in the fluid and attached to the lungs and pleuræ; sometimes the pericardium, and nearly always the pleura costalis, and in some instances the pleura pulmonalis, were also covered with a thick coating, or furred encrustation, of straw-coloured organized lymph, causing adhesion of the lungs to the ribs. This state was also accompanied with decay of the interior of the lungs to a greater or less extent.

All these cases at the onset appeared only slightly ailing, without any detectable disease or acute inflammatory action: no dubious symptoms whatever, to excite apprehension, but after a few days effusion supervened.

Our treatment may subdue the more violent excitability, but still the enemy continues insidiously creeping on, as indicated by a deepish heaving of the flanks, an ominous protracted lull in the system, the pulse never below 60, but varying from this to 76 or 82 for days and days together, or even for weeks, the patient never rallying as might be expected, but feeding daintily, looking dejected, or spiriting up for one moment at the sight of food, to be again downcast the next; he does not lie down, and in this state he may continue on for twenty-five or thirty days, if the effusion be on one side only, and the substance of the lungs not affected; but in from seven to ten days, if both sides are filling, and the pericardium involved, and we have fœtid breath, the case may be considered hopeless.

Condition determining Effusion.

Whether it is some unknown agency that finally determines or causes this inordinate separation of serum from the blood, or whether we have a glimpse, as it were, of this apparently inscrutable phenomenon, I will not discuss. But this we do find, that those horses which seem most liable to it are those with an inordinate growth of hair upon them, which would seem to arrest, or at least interrupt the seemingly feeble circuit of electrical action. They are of a gross habit of body; profuse perspiration is occasioned on the least possible exertion, the vapour of the body becoming condensed by the obstruction offered; the system seems as though it was surcharged with stagnant electricity, it may be *spent* electricity, too feeble to carry on the functions of vitality, which is marked by a depression of animal spirits, and dire

debilitating effects are soon induced; like as if it held the sources of life in its death-grip, for unquestionably there is a subtle and, when undisturbed, a latent substance or element pervading all material bodies, which is capable of exciting or destroying life. Some property of electricity in a state of equilibrium it may be, enshrouding and fostering a dormant condition, a condition at variance with the laws necessary for the maintenance of health; and, if existing in this state up to a certain point, its inherent properties or forces so accumulate, that any accidental circumstance in the animal economy may disturb and set them in agitation, causing their affinities to repel or attract each other, thus setting free a certain amount of electric fluid, for aught we know. This view I respectfully, but firmly submit, may result in like electrical phenomena in the cavity of the chest, and it may be in the fluids generally. We know that the air, when it is surcharged with electricity, has its invisible vapour instantaneously converted or condensed into drops of water, so moisture is eliminated and deposited, like dew upon the membranes, when the system is in a state of health, analogous to dew upon the earth; and effusion may therefore be likened to, and perhaps be dependent upon the same phenomena as showers. I say, then, it is probable that a certain combination of conditions, arriving at a certain state, result irresistibly in effusion; and that the substance or element is capable of existing in opposite states, and undergoing transmutation, is clearly exemplified in the laboratories of Nature and Art. It is very likely only a natural phenomenon, and one in accordance with inevitable laws, which most certainly will one day be clearly defined and understood.

Auscultation and Percussion.

The marked difference between the character of the sound to be heard when you apply your ear to the sides of a healthy horse which has been violently exercised, and one labouring under active disease of the respiratory organs in its early stage, is not so great as we should expect. It is true the sound of the former is somewhat more sonorous and distinct, and if you tap the sides with your knuckles, it sounds more hollow. In the latter it assumes a dull, *thodden* sound, but if effusion has actually taken place, on the side where it really exists, and the cavity is full, there is an entire absence of any sound whatever; there is a depth of water occupying the space between the ribs and the lungs, or else you have placed your ear opposite an adhesion, or again, if

the horse is enormously fat, or the lung be hepatized, you may not be able to come to a satisfactory conclusion; then you must always discriminate between the gurgling, gushing sounds often heard in the bowels, and mistaken for the rushing of water in the chest. They are heard at *irregular intervals* if the chest is only partially filled with water. You may by great patience and attention distinctly catch the *regular* sound made by the action of the water as it is compressed upwards, and then let rush down again, as the lungs recede or exhale air. The sound is not unlike that heard if you have a gallon bottle half-full of thin fluid and agitate it regularly about the rapidity of respiration. If you can distinctly hear the pleura pulmonalis rubbing upon the pleura costalis, and the air permeating the lung on the one side, and there is an utter absence of any sound whatever on the other; and if the animal indicates an evident apprehensiveness when this side is pressed, the pulse being above 60 for five or seven days, but sinking in condition, the attack having commenced with a grunting and sore cough, and there is now a deepish heaving of the flanks—not a quick heave—(this expressive phrase I have from Mr. Holmes of Beverly, whom I esteem no mean authority on these matters, see *Veterinarian,* vol. xxxii), I say if you have the above indications you may feel pretty certain there is effusion into the cavity, for they are criterions that will rarely mislead you.

Paracentesis Thoracis.

In February last I operated upon three horses within five days. They were young, valuable, fresh horses. I took fourteen quarts of water from one horse, being all I could get from the near side. He died six hours afterwards, when from three to four bucket-fulls more were found to exist in the same side, but there was none in the other side. He had been ill about twenty-six days. One of the others I operated on the off side, feeling convinced there existed fluid in it, but I could get none. I then operated on the other side, and took away twelve quarts. He died during the operation. After death it was found that the off side contained six bucket-fulls at least of fluid; and singular to say, this horse's breathing was comparatively tranquil till within six or eight hours of his death, and he laid down and rested quietly for a length of time, and that on both sides, up to a short period before he died. The accelerated breathing, and the other alarming symptoms, came on suddenly.

The third case I operated upon six times in sixteen days.

I took away thirty-eight quarts in the first four operations, and at the two last two bucket-fulls each time. In this case the lymph impeded the flow of the serum so much that I was obliged to employ a tracheotomy tube of wide calibre, and I even enlarged the opening and introduced my fingers into the cavity of the chest, withdrawing quantities of floating lymph, the pieces varying in size up to fourteen inches long by six inches broad and one inch thick. When the tube was in I could introduce a thin twig a foot long into the chest before it came in contact with the side. The horse was evidently very sensitive to the touch on the side. I had given large quantities of alum, also vegetable and mineral tonics with diuretics, and the best of keep for three weeks. In this case I operated every time on the near side. The other side was free from effusion. At the commencement there was crackling under the skin all over the body.

In all the cases I have operated upon I have found the fluid at first like in appearance to whey, and not very offensive; but after three or four times it becomes thicker, and the smell is then exceedingly disagreeable. I always endeavour to get away all the water I can by keeping the passage through the canula open, and making the horse move. When no fluid flows, although I feel convinced there is fluid, I infer that either my tube is not through the pleura-costalis, or else I am in contact with an adhesion, and I at once introduce the trocar into another place, and am not satisfied until I am convinced by air rushing in, which, however, I instantly stop and guard against as much as possible. It will be seen by my paper in the *Veterinarian*, page 323, vol. xxxiv, that I am not apprehensive of injuries arising from puncturing the lungs, nor from the admission of air. I have been present at the post-mortem examination of a case in which both sides were full of water, yet the veterinary surgeon, who is a careful, close observing man, did not apprehend any such disclosure. I have been told by another veterinary surgeon, of a case that was working regularly and appeared in perfect health up to the very day he died, when it was found that his chest was full of water.

Deductions.

It will, I think, be altogether superfluous for me to demonstrate or to remind my readers of the self-evident, real and magical effect that clipping has upon the horse in health. Yesterday he was distressed by ever so little exertion; he puffed and blowed and perspired if driven only at a moderate

pace; he became soon exhausted, could scarcely get along, stumbling frequently, and was in fact sadly under the mark. But to-day, having been clipped, lo and behold! he can go double the distance, and do double the work without fatigue; he is quick in his paces, light-hearted, and as elastic as a fawn. A marvellous change has taken place. What is it? Echo answers, what! I believe the best of us do not fully know what are the effects produced by clipping. Have we imported into his system, suddenly, an increased amount of strength, an increased amount of muscle, more blood, or more nerve? No, nothing of the kind. Then what have we done? Here is a fine field for earnest scientific contemplation. We are apt to say, he was foggy and very gross; but surely twenty-four hours cannot have made so great a change in him. Admitting even that the absorbents and capillaries do work day and night, they cannot remove all the obstructing interstitial deposits in this time. Now, since clipping can produce such marvellous effects in health, cannot it also be employed beneficially in disease? And it is here that I wish to converge and concentrate the full force of these pages. Yes, I can attest to its benign influence, nay its specific effect in the removal of chronic diseases, dependent upon functional derangement of the respiratory organs, and especially so in acute and subacute diseases of those tissues. I believe its beneficial influence is attributable to the altered arrangement of the electric forces, developing increased vitality. That the great supporter of vital power is an immaterial substance, closely resembling if not identical with that which has been termed electricity, will not be disputed; and when the horse is shorn of his hairy thick coat, the body is not insulated as it was before, and there is now established a free current or circuit of electrical fluid in and out of every part of it, creating an exhilarating excitement and an increased tone of the whole organic system. We find the surface of the skin is warmer in the clipped horse than it was before; it is quite manifest to the hand. That this augmentation or increased supply of caloric is derived from the increased combustion of carbon is more than probable; also more oxygen is consumed, and it therefore necessarily follows that the removal of this outer barrier to the passage of electricity into the body, which, in accordance with the inherent powers it possesses, is like a metallic chain extending from the conductor of an electric machine to the great reservoir of the electric fluid the earth, and therefore is, when excited, robbing the body of its greatest source of electricity.

The pathological and practical deductions, then, are these:

whenever we have a case where, to all appearance, there are decided indications of a strong tendency to effusion, when the skin is smothered and choked, the system suppressed and oppressed, the natural play of electric forces impeded and insulated, when cold air, cold water and mild febrifuge medicines (as advocated in my papers in the *Veterinarian*, vol. xxxiii), do not give relief, then I say have recourse to clipping at once; strip the integument of this non-conductor, this thick hairy covering, on the third or fifth day before effusion has taken place, with a view to prevent it; and even if effusion has commenced it is the most likely course to save your patient. You may take my word for it, the chances of saving your patient will be enhanced tenfold, and you can then employ the fomenting rug round the thorax. How does it act, do you ask again? I reply, I cannot tell in what manner it acts, it is one of nature's mysteries; but this it seems to do, it breaks the spell, for it at once dispels and disperses the stagnant electricity, removes the rankling arrow in the vitals, and thus flings out the death-dealing venom.

The young practitioner may perhaps hesitate; he may feel very sensitive and jealous of his reputation to even suggest this innovation into old time-honoured practices; his employer even may be at first startled and demur, but if he possesses the full confidence of his employer, as he ought to do, the reply will be, "Well, you know best; if it is absolutely necessary, and you are of opinion that it will benefit the animal, let it be done at once."

BOTANY AS APPLIED TO VETERINARY SCIENCE.

By W. Watson, M.R.C.V.S., Rugby.

(*Continued from vol.* xxxiv, *p.* 665.)

Occupying a prominent position amongst the plants yet to be described, whose leaves, stems, or roots supply a large amount of food for animals, will be found the "*Daucus carota*" (*common carrot*), and the "*Pastinaca sativa*" (*parsnip*). They both belong to the class of Exogens, the sub-class Calciflora, and to the natural order, "*Umbellifera*," which may be known by the following characters: "*Calyx* superior, either entire or five-toothed; *petals* five, inserted on the outside of a fleshy epigynous disk, usually inflexed at the point; *stamens* five, incurved in æstivation; *ovary* inferior, two-celled, crowned by

a double, fleshy disc; *styles* two, distinct; *stigmas* simple; *fruit* consisting of two carpels, separable from a common axis, to which they adhere by their face (*the commissure*); each carpel traversed by elevated *ridges*, of which five are primary, and four, alternating with them, secondary; the ridges are separated by *channels*, below which are often placed in the substance of the pericarp certain linear receptacles of coloured, oily matter, called *bittæ*. *Herbaceous* plants, with fistular, furrowed stems; *leaves* usually sheathing at the base; *flowers* in umbels. "The flowers growing in *umbels*, the superior *petals* turned in at their points, and the inferior fruit, which splits into halves, commonly called seeds, are of themselves sufficient to distinguish this order."—*Lindley*. To this very important natural order belong many plants of much interest and value, both in medicine and domestic economy, some also being poisonous plants. Classed under this order among the plants used as food and in domestic economy, we find, not only the "carrot" and the "parsnip," but also our common "celery" (*Apium graveolens*), and "parsley" (*Petroselinum sativum*), &c. Amongst the medicinal plants are the "hemlock" (*Conium maculatum*), "aniseed" (*Pimpinella anisum*), "fennel" (*Fœniculum vulgare*), and several others which yield valuable gum-resins. Among the plants which have proved poisonous to man and animals—which I shall again refer to when considering this part of my subject—will be found the "water dropwort" (*Ænanthe crocata*), "fool's parsley" (*Æthusa cynapium*), "hemlock" (*Conium maculatum*), and the "cowbane, or water hemlock" (*Cicuta virosa*), &c., &c.; these latter being chiefly found in damp situations.

This is one of the natural orders to which I would direct especial attention, as being likely to be brought under the notice of the veterinary surgeon, and an acquaintance with which may prove to him of great practical utility. It cannot be expected that, amidst the many important duties which attend and occupy the time and attention of our professional life, nor is it necessary, that we should make ourselves familiar with the somewhat minute and difficult divisions into which plants belonging to this and other natural orders have been classed, and which can only be obtained by a constant application to this particular subject. But if we make ourselves familiar with the great primary and secondary divisions into which, according to the Linnean system, the vegetable kingdom is divided, and the leading characters of the different natural orders under which the great variety of plants are described, we shall find little difficulty, when called upon, by a reference to some standard work upon the sub-

ject, in readily obtaining all the more detailed information we require.

"*Daucus carota*" (*common carrot*).—"*Fruit* lenticular, compressed from the back; *carpels* with four secondary ridges, which are of equal size, winged, and completely broken up into prickly teeth; a *biennial*, with a fleshy tap-root; *stem* trispid; *leaves* two or three, pinnate, not at all shining; *leaflets* of the involucre trifid and pinnatifid, as long as the umbel." —*Lindley*.

This little, insignificant plant, with its tough, wiry, and somewhat disagreeable-flavoured root, is found growing wild on gravelly soils in the fields and hedgerows in many parts of this country. It is familiarly known by the resemblance of its umbels, when ripening its seeds, to a bird's nest. It is supposed by most authors to be the original source from which, under the influence of agriculture, the present luxuriant and richly flavoured carrot has been obtained. There are several varieties, such as the Dutch, the Orange, and the Altringham (several magnificent specimens of the latter, exhibited by the Duke of Portland, attracted much attention and obtained a prize at the Birmingham Cattle Show), but the long red and the white being the most extensively cultivated, a brief description of them will suffice. They thrive best on a loose, sandy, but deep soil. The seed is generally sown at the end of March or the beginning of April, the plant flowers in July, and the crop is generally taken up towards the end of October. The produce varies considerably, according to the soil, &c., being from ten to twenty tons per acre.

The red carrot contains much more nutrition than the white. As food for animals, both the leaves and root of the carrot are of great value, and much liked by them. They are considered also very valuable in diseases of the respiratory organs, such as in "chronic cough" and "broken wind," also in diseases of the skin, and when given to assist in restoring horses from any debilitating disease.

"*Pastinaca sativa*" (*parsnip*).—"*Calyx* almost obsolete; *petals* roundish, entire, involute, with a broad, inflexed, blunt, middle segment; *fruit* flattened at the back, surrounded by a dilated, flat margin; *carpels* with very fine ridges, the three dorsal equidistant, the two lateral contiguous to the dilated margin; *channels* with simple bittæ; *involucre* neither universal nor partial, or with very few leaves; *flowers* yellow; *leaves* simply pinnate, downy beneath, or oblong-obtuse, crenated leaflets, of which the lateral are lobed at the base."—*Lindley*.

This plant is found growing wild in many parts of this country, especially in the chalk districts, and it much re-

sembles in its wild state the carrot, in having a dry, tough, somewhat acrid-flavoured root.

There are several varieties of it, but the common long-rooted, is the one mostly cultivated. Like the carrot, it requires a deep and somewhat dry and sandy soil. It is sown generally in April, flowers in July, and is taken up in November. It much resembles the carrot in its general properties, being, however, sweeter in taste and is said to be more nutritious. All animals are fond of it. "Cattle and pigs fatten upon it. The beef and pork of Jersey, where the parsnip has been used for centuries in the process of fattening, long ago possessed the reputation of being equal, if not superior, to any in Europe." It is also valuable for horses, milch cows and poultry; the latter fatten upon it, and their flesh is said to be much improved in flavour by it.

WORMS IN THE EYES OF GEESE.

By M. Small, Sen., V.S., Dublin.

I send to you the following, taken from the *Irish Farmer's Gazette*:

Worms in the Eyes of Geese.—"Sir,—The most singular thing I ever heard of has happened to our geese this year. They are all going blind and pining away. I had one of them killed; and when we opened the eyeball, a small black worm, just like a young leeeh, came out. It was very lively, and when it was put into water it swam about exactly as a leech does. I sent the insect alive in a bottle of water to Dublin, to Mr. Small, of Aungier Street, who is our veterinary surgeon. He has ordered us to cut open the eyeballs of those affected with a lancet or sharp penknife. If any of your numerous readers have ever been tronbled in this way with their poultry, and would state what is best to do to prevent or cure the complaint, it would confer a favour on yours, &c., J. M'Keown, Land Steward to Sir John Macneil, Miltown Grange, Castlebellingham."

With reference to the above letter, I think it an extraordinary and almost unaccountable phenomenon. I have one of the parasites still alive in water at my hospital in Aungier Street, Dublin, where the curious may examine it.

It appears that the eye affected first inflames, and the cornea, or front of the eyeball, loses its natural transparency and becomes white. By degrees the eye gets too large for the orbit or socket, and is projected outwards, evidently causing much pain to the animal. The disease only attacks one eye. Being in the vicinity of Milltown Grange the

other day on other business, I called to see these animals, and operated upon two of them by slitting open the cornea with a pair of scissors, and allowing the parasite to escape. In every case it comes away alive, and can be kept alive in water.

These geese have access to a rivulet, with a clay bottom, that communicates with the River Fayne, and in which are numbers of the common ditch leech. Is it possible that the leech-spawn swallowed by the animal could be thus generated, or how gets the parasite into the chamber of the eye?

On the subject of worms in the eye of the horse, the following short letter is published in 'Percivall's Lectures,' vol. iii, page 235:

"I have been favoured lately with some observations on the presence of these worms in horses by W. Twining, Esq. (surgeon to the Commander-in-Chief), who has written on the subject in the 'Medical Society's Transactions' at Calcutta, from which I will now give you an extract. He says—'Sir E. Home mentions' in his 'Lectures on Comparative Anatomy,' that the arteries of the ciliary processes in the horse are comparatively very large; and that Sir E. is led to believe that the two species of worms, the *strongylus* and *filaria*, found alive in the aqueous humour of that animal in India, obtains access through these arteries; and this opinion is the more probable since similar worms are known to be occasionally in the blood.' Mr. T. adds that several circumstances concur to render it probable that the ova of the *filaria equi* are received into the stomach with the food, and that these ova, taken up by the absorbents, flow with the blood into various parts of the body favorable to the development of the worm, which having been accomplished, its further progress may be impeded by its augmented size. Sir A. Cooper's observations on worms found within the cœliac artery of the ass may be considered corroboratory of all this, though it must be confessed the subject yet lacks eluci. dation."

TETANUS SUPERVENING OPEN-JOINT.

By F. F. S. Constant, M.R.C.V.S., V.S. B.H.A., India.

On perusing some of my notes on the treatment of horses, the property of officers, I find the following:—I was called to

attend a gray horse, the property of one of the officers of the 3rd B. E. Regiment, that had fallen with its rider a day or two before I saw him. On examining the animal in question, I found he was the subject of severe laceration of both knees, but more especially of the near one, from which a small amount of synovia was escaping, the result of injury of the sheath of the extensor metacarpi magnus tendon. I had both wounds cleansed, and to the near I applied a cataplasm, consisting of alum and flour; to the off, there being merely the protrusion of the subcutaneous tissue, I applied simple pressure by means of cold bandages, ordered to be kept wet, externally. I then left directions for the animal's head to be tied up, to prevent his lying down, and he was to get only bran mashes and green grass preparatory to a dose of physic. Two mornings afterwards I again saw my patient, had the physic given him, and dressed the wounds as before. There was no escape of synovia visible when the cataplasm was removed. I visited him again as before, the physic had operated, and the wounds were doing well, the off one being now dressed with a solution of the sulphate of copper, with a view to suppress the luxuriant granulations. At the expiration of the week the treatment was changed, the wounds being then dressed with Ung. Alum. comp., under which they progressed favorably till about three or four weeks after the accident, when on visiting my patient as usual my attention was attracted by his tail, the position of which I did not like, and on walking quietly up to his head the disease from which he was then suffering was perfectly manifest. His head was protruded, the nostrils dilated, his eyes retracted and partly concealed by the cartilago nictatans; and in short, every symptom indicative of tetanus. On looking at the wounds I found them unhealthy: I had them freely fomented, and left to nature. In the mean time I sent for the following:

℞ Ol. Crotonis, gtt. xv;
Ol. Lini, Oiss;
Aloës (in solution), ʒij. Fiat haust.

This was given, although the animal's jaws could only be parted for about an inch. I then left orders that he was to be kept as quiet as circumstances would permit—unfortunately, the stable he occupied formed a corner of two of the principal thoroughfares, and through them there was much traffic—and that a pail of warm gruel, to be occasionally renewed, should be left in the stall, in which he was permitted to roam loose.

I found it necessary to repeat the above draught every second morning for four times. The second dose contained Ol. Crotonis gtt. xx, the third and fourth Ol. Croton. gtt. xxx, Aloë ʒiiss; the Ol. Lini was in the same quantity as in first draught; and with the last dose the bowels were only slightly relaxed. However, suffice it to say the animal ultimately recovered. At one time the lungs became so much affected that I thought I should have lost my patient, the respiration being so greatly impeded that the owner was for having him destroyed, but I was averse to it, as I did not wish to lose the opportunity the case afforded me. From the time the animal injured his knees till the time of his recovery he was kept on succulent but nourishing diet, yet when convalescent he was a perfect skeleton. Having recovered a little his condition, he was sold some time afterwards to an officer of the same regiment, who has him in constant use in this station. Since here I was called to attend him, he being the subject of a slight attack of gripes. He was then in good condition, but there are still to be seen small marks where the wounds originally existed.

ON CASTRATION BY SCRAPING THE CORD.

By "A Subscriber."

India; *October*, 1861.

Gentlemen,—In the *Veterinarian* for August last there is a letter on castration from Mr. Constant, in which he says, with reference to the operation by "scraping" the cord, "I consider it is attended with too much suffering to the animal, while in itself it is a cruel and unscientific method." I must beg leave to differ with him on this subject. I first saw the operation performed in this way in March, 1858, and was so impressed with its simplicity and satisfactory result that I have ever since castrated by scraping, except in cases where I find the testicle or cord unusually large or diseased. In the healthy subject the whole operation is over in about five minutes from the time the animal is firmly secured, and the only instruments required are a scalpel and a small knife with a serrated edge. Clams are not wanted; the resistance from the cremaster is got rid of by cutting through the pos-

terior part of the cord, and the vas deferens is disposed of by the same incision. I maintain that the pain produced by the scraping of the fore part of the cord is not so great as that which would result from the pressure of the clams while performing the operation by torsion, as recommended by Mr. Constant. I would also prefer opening the scrotum by *one* sweeping cut of the scalpel, even at the risk of wounding the testicle, than have recourse to scissors for the purpose of prolonging the original incision in the skin, &c., of the scrotum. I believe the former would be productive of less pain than the latter. I have castrated a great number of horses during the last three and a half years, and *all* have turned out satisfactorily. The patients are generally at duty again in twelve days, and are seldom under treatment more than fifteen days. In my opinion, the operation by scraping has everything to recommend it when the parts are in a normal state.

I may here remark that in an officer's charger, which I castrated this year, I found the artery at the *posterior* part of the cord. This is very unusual, but it is well to keep a look-out for such irregularities of structure, as they may lead to an unpleasant mistake if overlooked.

When I have to operate on an animal with thickening of the cord, enlarged testicle, adhesions, &c., I do so by ligature, as performed by surgeons on the human subject. I take up and tie the *artery only, i. e.* the spermatic artery; the artery of the cord is generally too insignificant to require a ligature, but not always. The clams are required for this operation, but are only in use for about ten minutes.

To the Editors of 'The Veterinarian.'

DISEASES OF ELEPHANTS AND CAMELS.

By the Same.

Can you inform me if there is any work in existence on the diseases of the elephant and camel? I mean any work that will *repay perusal.* There is a book on this subject by Gilchrist, which I have seen, but it is only fit for a farrier or cattle sergeant to refer to, and the chances are it will mislead them when they do look into it for information.

An epidemic broke out here last month among the Government elephants, and the brigadier-general commanding the

division ordered a special board to assemble to examine the animals, and prescribe for them. The board consisted of a cavalry surgeon-major as president, and another veterinary surgeon and myself as members. On our arrival at the cattle yard we found that four elephants had already died, and three more were presented to us very ill indeed. We also looked at all those that were healthy, forty-five in number. From the inquiries we made, and from the appearance of the animals, we came to the conclusion that they were attacked with a severe form of intermittent fever, a disease to which they are said to be peculiarly liable, and which always occurs in a very aggravated form among elephants. We recommended a dose of cinchona bark to be given three times a day to each of the sick ones, and an occasional enema; and further, that the food of *all* the elephants be changed for a time from "atta" (flour) to rice, and from coarse jungle grass to good wheat straw, and that their place of watering be changed also. Since we saw them (now a fortnight ago), I hear that all the three we examined have died, and that only one other elephant among the healthy ones has been attacked, and he died; so that our *hygienic* treatment appears to have been successful, although the *then* sick ones did not benefit by our prescription. But with reference to the latter, it must be remembered that before our visit they had been *bled and physicked!* and crammed with all sorts of native "mussalahs," or spices, so that we had not a fair chance.

As each elephant is worth from £60 to £70 to the Government, it becomes a serious thing when a number of them die from an epidemic. I should like to "read up" on the subject; if, therefore, you can recommend me a good work, I shall feel extremely obliged. Veterinary surgeons in India ought to know something about both elephants and camels.

[We concur with "A Subscriber" in his last remark, anp regret that we are not acquainted with any work on the diseases of the elephant, &c., but that of Dr. Gilchrist, the contents of which appear to have been chiefly gathered from the native doctors. Scattered facts may, however, be picked up here and there.]

CASE OF LACERATED WOUNDS OF THE ABDOMEN, WITH PROTRUSION OF THE INTESTINES.

By F. B. Taylor, M.R.C.V.S., Denbigh.

A horse, the property of Mr. Anwyl, of Launt, near this town, having run away with the harrows when at work, and being consequently very dangerously injured, the services of a veterinary surgeon were necessarily called into requisition. Upon my arrival I found several lacerated wounds extending through the whole of the integuments of the abdomen, from one of which the viscera were protruding some yards in extent, and these being confined at their outlet by a very small and contracted aperture, and from exposure to the atmosphere, aided by the undue weight consequent upon their pendant and overgorged condition, they presented a nigrescent and morbid appearance, indicating the speedy approach of decomposition. I immediately cast the animal and enlarged the orifice, and, after the necessary ablution, I was enabled by careful and protracted manipulation to return the swollen and displaced intestines, and to retain them by the employment of sutures and appropriate ligatures.

Inflammatory symptoms, together with considerable febrile action, simultaneously manifested themselves, but these were effectually combated by depletion and other remedies. The animal having perfectly recovered, was again employed in his usual agrarian and other labours for upwards of a month, without intermission. Although thus unexpectedly rescued from an apparently inevitable end, this ill-fated quadruped, as though pursued by a peculiar fatality, appears to have been destined but for a brief career. For having been subjected to much over-exertion, a considerable increase in the animal temperature, accompanied by much perspiration, was the natural consequence. In this state of sudation he being allowed on one occasion to drink cold water *ad libitum*, an acute attack of cholic was induced, which terminated fatally in a few hours.

Facts and Observations.

THE PROSPECTS OF THE VETERINARY PROFESSION.

A GENTLEMAN recently returned from Australia informs us that, in consequence of lack of veterinarians when pleuro-pneumonia broke out in the colony, several non-professional persons were appointed as inspectors at a salary of four guineas per diem. From another source we learn that, in the province of Otago, in New Zealand, several "scab inspectors," who have to report on the disease of sheep, and especially to inquire as to the progress of the dreaded scab, have been appointed at large salaries from amongst farmers, in consequence of the want of veterinary surgeons. There is but one veterinarian in Otago, whose prosperity is only equalled by the great need for his services felt by the colonists within his reach.—*Scottish Farmer.*

FORMATION OF GALL-STONES.

DR. THUDICHUM has observed casts of the biliary ducts in the very centre of gall-stones, from which he infers that the formation of these concretions is not confined to the gall-bladder. In this view he is borne out by the fact that in the horse accumulations of this kind are met with in the ductus choledochus communis of that animal.

According to him, the essential constituents of gall-stones are cholochrome, cholic and choloidic acids, and earthy salts; these being the products which are precipitated during the putrefaction of bile out of the body. His conclusions, therefore, are that gall-stones result from a putrefactive change set up in the bile, by which it acquires an acid reaction.

ARTIFICIAL PRODUCTION OF DISEASE.

DR. HARLEY has lately stated, that medical science had arrived at that stage of advancement that they had not only the power of initiating, but also at pleasure calling into existence, certain diseases. Thus, for example, by injecting

a few drops of alcohol into the portal vein they could give an animal diabetes; by puncturing a portion of the medulla oblongata, or by pinching the par vagum, palpitation of the heart; and not only could they produce these, the symptoms of disease, but even morbid changes themselves. Thus, by directly acting on the pneumogastric nerve, cough, or increased bronchial secretion, could be rendered on the one hand, and, on the other, anatomical lesions of pneumonia and pleurisy. So, again, by exciting the solar plexus they could bring on diarrhœa and dysentery, together with the structural changes which habitually accompanied them. Nor was this all. They had it in their power to induce diseases of a more general nature, for with a drop or two of acid they could call into existence rheumatism and heart disease, or with a little decaying organic matter bring on fever and death. Then, again, as far as surgical diseases were concerned, there was scarcely one which they could not produce artificially, no matter whether it were a cataract in the eye or a stone in the bladder. In fact, the further they advanced the more clear did it become that man had it in his power, not only to produce morbid symptoms, but even actual diseases, with their complete chain of results.

COMPOSITION OF PUS.

The following has been given by Glesecke as the composition of healthy pus, which was thick, of a pale-yellow colour, slightly alkaline, had no smell, sp. gr. 1022.

Water	88·76		
Solid matters . . .	11·24	Organic matter .	10·12
		Inorganic ,, .	1·12
	100·00		

The solid matter was composed of—

4·38	albumen dissolved in pus-serum.
4·65	pus-globules, mucus, and a little leucin and glucin.
1·09	cholesterin, with some other fat.
0·59	chloride sodium.
0·32	soda (from its albuminate), a little phosphate of soda, and a very little sulphate of potash.
0·21	phosphate of magnesia, lime, and oxide of iron.
11·24	

HIPPOPHAGY (HORSE-EATING) IN ALGIERS.

At Algiers, a few days back, a considerable number of high public functionaries, superior military officers, judges, and clergy, partook in the saloon of the theatre of a grand banquet, the greater part of the dishes of which were composed of horse and ass flesh. The object of getting up the feast was to combat the popular prejudice against such food. The different dishes were dressed in the French style, and declared excellent. One of them consisted of a young ass roasted whole. After the dinner suitable toasts and speeches were delivered. One of the latter was by M. Decroix, veterinary surgeon of the 1st Mounted Chasseurs, who maintained that horse flesh is very nutritious, and that the general adoption of it as an article of food would present many advantages.

Our readers will remember that a short time since the celebrated naturalist Geoffrey St. Hilaire died. He was the founder and president of the Society for the Acclimatization of Animals, of Paris; by which many have been added to our domestic family. To the last he advocated the use of horse flesh as food, eating thereof himself at public dinners as a proof of his sincerity. And why not? In Russia horse flesh, it is well known, is always sold in the markets with the flesh of other animals as food for the people.

COUCH-GRASS A REMEDY, AND AS FOOD.

An infusion of the *Triticum repens,* couch-grass, in the proportion of one ounce of the dried and cut stem to a pint of water, and given in the course of the day, has been found by Mr. H. Thompson, of the University Hospital, to be very beneficial in irritable conditions of the bladder. According to him, it is important that the plant should be gathered in the spring, shortly before the leaves appear; the stem is then to be slowly dried without artificial heat, and cut into the requisite lengths for use.

Professor Burnett, speaking of this grass, says, "The couch-grass of the farmers, which is here regarded as a noisome weed, is collected on the continent as food for horses. Cattle of all kinds are fond of the underground shoots of this plant, which are sweet and wholesome. Sir Humphrey Davy found them to contain nearly three times as much nutritious

matter as the stalks and leaves, and it has been stated, on the authority of a French veterinary surgeon, that exhausted and worn-out horses are very speedily restored to strength and condition by giving them daily one or two bundles of couch-grass, of ten or twelve pounds' weight each, mixed with carrots.

NEW SALT OF IRON AND QUININE.

The following compound has been advocated as a tonic by Dr. Fergus:

Sulphate of magnesia	80	parts.
„ of iron	15	„
„ of quinine	5	„

In a solid state it remains unaltered, while it forms a perfectly clear solution, in which more quinine may be dissolved, if desirable.

ROOT OF BLACK HELLEBORE.

It was stated by Mr. Hanbury, at a late meeting of the Pharmaceutical Society, that he believed there are none of the roots of black hellebore to be found in the market. Of four samples he had bought, two were *actea*, and the others neither actea nor hellebore.

Mr. Squire said whenever he wanted black hellebore root, he dug up a Christmas rose, and Professor Bently, in confirmation, stated that all the so-called roots of black hellebore, were those of the *actea rosea*.

NATURE OF THE DEPOSIT IN REINSCH'S TEST FOR ARSENIC.

M. Lippert has ascertained that the deposit which takes place on the copper used in Reinsch's test for arsenic does not consist of pure metallic arsenic, as once thought, but a mixture or alloy of copper and arsenic, containing 68 parts of the former to 32 of the latter.

He says, "The great sensitiveness of the process, therefore, arises from the large proportion of copper united with the deposited arsenic; and once aware of this fact, we can resort to it without inconvenience from knowing that all the arsenic will not be volatilized under the influence of the hydrogen current, as half, at least, will remain in the deposit."

THE VETERINARIAN, JANUARY 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

THE ANNUAL ADDRESS OF THE EDITORS.

"The years are marching onward! See another draweth nigh,
And silently and mournfully the old one passeth by;
It carries many memories upon its hoary head,
Some are of new-born joys, and some of pleasures fled."

"How shall we welcome in the new-born year?
Not with the ringing voice of mirth alone,
But with a mingled melody—a tone
Of grateful joy, mixed with a reverent fear."

The seventh, the mystical year, has passed, and with the present number we commence the eighth year of our editorial labours. They have been pleasant, because the results have exceeded our expectations, and our aspiration is that we may continue to receive the support hitherto accorded us, for then all will be well.

Having been benefited, in common with others, by the withdrawal of a certain fiscal impost, we are desirous that our readers shall share with us in the advantage obtained; we have, therefore, resolved not only to print the Journal on better paper, but also permanently to enlarge it. Oftentimes we have been obliged to increase the number of our pages, so as to insert the matter forwarded to us, even although small type has been very freely had recourse to, and some sections appeared wholly in that form. Frequently, too, we have had to apologise for non-compliance with the requests of our contributors, in consequence of their communications not having found a place in the then current number. We may now anticipate that this will be obviated for the future. Should, however, the necessity arise, we shall be most happy again to add to our space. Nor is this unlikely, since we live in an age, not only of mind-progress, but of transition and great mechanical

activity, leading to invention, the highest faculty of the human mind. The future seems big with events and replete with undiminished interest to our profession. At such a period to stand still and become stagnant would be fatal to us as a body, nor do we for a moment apprehend that this can or will take place.

Another year has passed into eternity since our last address. By these recurring periods we note the swift passing of time, which is so rapid that even while hailing its coming it is gone, leaving only the reflection it cannot be recalled. "It flies like the shadow's fleeting form, that mocks the gazer's eye." Its pulses beat quick and incessant, intermitting not. "Time," says a modern writer, "seems to go as the winged arrow flies through space when urged from the elastic bow by the muscular arms of an athlete; or like some shooting star, that sweeps the sky, and is again lost to sight ere you are aware. Day follows day in quick succession; morning gives place to noon, and noon to night; and night again disappears before the rising sun. The seasons, too, march on with hasty steps; spring appears in her welcome livery of leaves, and buds, and fragrant flowers, but she soon yields up the reins to her fair sister summer, who in her turn spreads out her verdant carpet on the floor of nature, and fills the boughs of goodly trees with fairest summer fruit. But, scarcely have we had time to welcome her arrival, when lo! she turns away, and autumn spreads her fields of smiling grain, whose golden ears, in graceful undulations, repeat the annual story of the great Creator's goodness; whilst under the moving influence of the winds of heaven they simultaneously bow, in mute acknowledgment of the Almighty's care, a tribute oft refused by the senseless creature, man. Then comes stern winter, with its icy manacles and snowy garments, to put a new complexion on the scene, reigns its appointed time, and then departs. Thus ever-moving time goes on apace with rapid steps, and leaves the footprints of age upon our brows; the periods of infancy, youth, and early manhood pass away as a dream, and 'we spend our years as a tale that is told.'"

It, is therefore, both wise and profitable to take a retrospect of the past, pregnant as it is with resolves and eloquent with thought. From this stand-point we can discern what advance has been made, and whether all has been done that might and ought to have been, and if not, to arrange for its future performance, humbly and hopefully, but seriously and earnestly; since, if it be commendable to improve the time present, it is equally so to provide for that which is to come. Our period of probation is over; a septennary test has been ours, and we are well known to those with whom we have to do, albeit they may expect from us more now than erst was the case. We have, however, no fresh propositions to make; we are only anxious satisfactorily to perform what we have promised, for we would not "keep the promise to the ear and break it to the sense." The profession will accept what has been done as an earnest of what will be done. We are, we confess, extremely solicitous to render the Journal worthy of its position, and to make it the independent exponent of the wishes and feelings of our professional brethren, which cannot be accomplished without a continuance of their co-operation, and this we shall ever strive to merit. We are willing to give to it our mental labour in thought and energy and what few talents we may possess, believing the cause is worthy of it; although we know "the race is not always to the swift, nor the battle to the strong." But

"The merit lies
In the struggle, not the prize."

Life and truth alone are everlasting. The similitudes of this life are many. By some it has been compared to a battle, in which there is a place in the ranks for all; by others to a field, which requires cultivation ere it yields any fruit.

"Let us, then, rise to nobler toil,
For life has truths that wait our learning,
And hath a hidden precious spoil
Worth the whole cost of life for earning."

One among our own number, and known to many of us, concurring with the immortal bard, has likened it to a stage, and says—

> "The shifting scene
> May change, and change the actors, but the play
> Is still the same, and the things that come between
> The cradle and the grave, repeat to-day
> The same old moral taught in ages pass'd away."

But we have said we are contented, nor do we in the least despond; contrariwise, we look upon what has been effected with the utmost satisfaction. We perceive that our list of contributors has continued steadily to increase. We have therefore to thank our friends, and our heart accompanies the expression, for their support and confidence. To several we have been, and still are, indebted for a series of papers on subjects full of interest to the profession. Mr. Ernes has also uninterruptedly given us important translations from the foreign veterinary publications, by which not only have our pages been enriched, but we have been enabled to see the advance the profession is making on the Continent; while at the same time they show, by comparison, the position in which we stand. Knowing that these continuous papers were of great worth, and approved of by the profession, we ventured a short time since to make an appeal to the body that some one would take a subject up, as others had done; and we have now the gratification of announcing that one of our most esteemed correspondents has promised us a series of papers on some very important diseases affecting the horse, the first of which will appear shortly.

As in years gone by, we have laid the periodicals in connexion with the collateral sciences—several of which we exchange with—under contribution to our Journal, our object being the maintenance of the status to which it has attained, and a desire to promote the onward march of the profession. Our aim, of course, has been to accumulate facts, which may serve as centres for others to cluster around; so that by them we may hereafter be enabled to tide over obstacles which may present themselves, whether they appertain to the treatment of diseases, or that which

marks the scientific and the educated man, correct diagnosis.

The continuation of some of our extracted articles has sometimes been placed far apart, through other matter of immediate interest presenting itself; but we hope this has not lessened their value as a whole. Much that is suggestive has found a place, and if the formulæ have not been always applicable, they might easily be made so by the educated practitioner.

The subjects of cruelty to animals and vivisections have occupied many of our pages, and we were pleased with the conclusive rejoinder made to the French vindication of these cruelties by the *Society for the Prevention of Cruelty to Animals* in this country.

Being aware that our Journal is often referred to in cases of Veterinary Jurisprudence, we have given insertion freely to all the cases that have come under our notice, and we are obliged to several correspondents for papers sent containing others.

The sale of diseased meat in our metropolitan markets has not been left unnoticed. "Salus populi suprema lex esto." Good has unquestionably resulted from magisterial interference, since the quantity of bad meat sent to the markets is lessened, besides which the salesmen are on the alert, and have not hesitated to inform the officers of the arrival of diseased meat, and even to give them the names of the senders. We are glad to know that before the meat is sent away it is subjected to a chemical process by which it is rendered altogether unfit for food.

During the past year we have seen that as a body we are becoming publicly recognised, and it will be the fault of the members of the profession if this does not continue. They have a right to urge upon those in authority, that none but graduates or certified members of the Royal College of Veterinary Surgeons shall be recognised as being worthy to fill appointments under Government or elsewhere. Let us make this our stand-point, and we have no doubt much good will in the end be effected.

We are sorry to be obliged to add to this resumé that we continue to receive more communications breathing a

spirit of contention than we like. From time to time we have exercised our editorial authority in withholding sentiments that were uncalled for, from their being of a personal nature. How often must it be stated that personalities never strengthen a weak cause, while they detract from a good one, which needs them not. A modern essayist, writing on controversy, and denouncing the bitterness and hatred too often engendered by it, asks, "What right have we to confound things with persons? We may say the truth to *things* however hard it may be, but to *persons* we must be courteous." With this we concur, remembering that the wise man saith, "Only by pride cometh contention, but with the well-advised is wisdom." We would that the cincture of friendship bound us all in one common whole, and that we were actuated by only one common motive, the advancement of our profession. Differences of opinion ever will exist among us, but it should be borne in mind that while to each is freely given the liberty boldly to express himself,—it is, in fact, his inherent right,—a strong man can afford to yield up points of lesser moment in argument, and will not allow himself to be annoyed by mere quirks and quibbles. There is also a manly frankness in the discussion and ventilation of a subject which admits of mutual forbearance, tending to edification; the last-named being altogether lost, if the first does not obtain. The strongest are always the mildest, and were we more easily convinced we should prove more tractable, and receive the greater amount of good. It would be well also to remember that we have to do with men of like passions with ourselves, and as we mete out to others so will it be meted to us in return. We therefore should possess more charity, and a less desire to caricature and exaggerate opinions. For all to think alike, is neither possible nor desirable; since by well-directed controversy oftentimes truth is elicited and established, and this diversity of opinion becomes both a proof and a cause of progress. It may, perhaps, be hard really to love those who always oppose and contradict us, but surely it is not a Christian spirit to return railing for railing. We should rather put a charitable construction upon the

words used; and if they be somewhat strong, accept them in the least offensive sense, then would discussion assume altogether a different aspect, and mutual benefit more frequently be the result. More union, too, would exist among us, since assuredly we may have unity without uniformity. Truth, of course, is the object being sought for; and as this we are told requires digging deep to find, so many labourers are engaged in the search for it, and the work will only be done pleasantly by a friendly spirit actuating those who are so occupied. Petty jealousies, and mere personal interests, should always be sunk for the general good; and if we are ever to take our proper position in society, and our profession is to be estimated as it merits, not only must this be the case, but the apathy that prevails among us give place to earnest zeal and a determination to press onwards.

By these strictures—which we hope will not prove valueless—we are reminded of a fact in natural history: there is a variety of the *Asterias,* which, when committing suicide, first throws off its arms, then breaks up its centre, so that nothing remains of one of the most beautiful forms in nature but a thousand wriggling fragments. Let us not be like it.

Although it may not be said of us "Sic vos non vobis," having had a desire to obtain the guerdon for our labours, yet we doubt not that much we have done will be questioned as to its judiciousness. A celebrated writer has said, "I would that every fastidious judge of authors were himself obliged to write—there goes more to the compilation of a volume than many critics imagine." The golden rule might profitably be acted upon here. But all men no more think alike than they grow alike. It would be a dream of cloud-land to expect it. Nor is it desirable that they should. Perfect uniformity would lead to monotony in the natural world, and be a stop to advancement in the mental. The rays of light differ in their hues and brilliancy; the trees vary in their form, character or kind; and the types of animal creation are severally adapted to the sphere in which they exist. There is no doubt the

present age is one of excitement. Every one is seeking, like the Athenians of old, for something new. It would seem to be the beginning of the end, and it has been asked Is the world growing old? And in reply it has been said, "Judging from the time that has elapsed since its creation, it might seem so. But, indeed, it never was so young. It might have come out of that mythological cauldron which imparted to bodies a wonderful rejuvenescence. It is profuse of energy. It is eminently self-assertive. It looks with contempt on all accustomed trains of thought. It must have originality; at least it must believe it has. It not only despises all crutches, but would fain altogether dispense with a centre of gravity. It is like the youth just set free from school, wild, reckless, impulsive, daring; acknowledging no subjection, seeking to rule all, not by his wisdom, but by his strong will. It has great powers and great passions. . . . . We live in a day of unusual craving after amusement, a day of enormous excitement; when men live fast, travel fast, write fast, read fast, think fast, get rich fast, and do every thing but hold fast." It must be conceded that the principles of the present day are, in the language of Mr. Cobden, expansive, and that we are touching upon a cosmopolitan age and wider sympathies. The revolutions that are taking place around us prove the advantages which result from the powers of mind-culture and æsthetic study; and these cannot fail to augment the benefits we derive from the changes brought about, since by them the general interests of mankind are advanced. It would, therefore, be equally a matter of regret as of surprise, if veterinary science did not participate in the advancement; and we are satisfied we carry with us the feelings of every friend of our art when we assert this.

We have before remarked that we would not have "Mens conscia recti," a mere idle phrase with us, nor one lightly esteemed: nevertheless, while to those who have endeavoured to perform their duty well, the approval of their consciences will be a high and permanent reward, this feeling will be heightened very considerably by the expression of satisfaction on the part of those for whom they

have acted, as by this at once they know that their labours are appreciated. and they have gained esteem and respect. If, however, we have not even succeeded in this, the fault may not have been altogether ours, since

"The attempt, and not the deed, is in our power."

The poet has told us that, "billows of disappointment roll along the easeless tide of time." What if some have not acted as we had thought and hoped they would? from others we have received more than a compensating support, therefore have we much cause for self-gratulation and gratitude, both to inspire confidence and to stimulate us to renewed exertions for the coming year.

Turn we now to a less pleasing theme, although not less profitable, if rightly viewed. Our necrology for the past year may not be very large, yet it contains some well-remembered names, of whom but few had attained to the limited age of man's probationary existence upon earth, their sun having gone down at noon. But one—the father of the profession, whose death was recorded in the first number of the Journal—had exceeded it. Yet

"Those who the longest lease enjoy
Have told us with a sigh,
That to be born, seems little more
Than to begin to die."

Death has been designated the twin of sleep; but there was no grave in the untainted Eden of man primeval. Man was not made mortal. Well has it been said, "Life is to all men a voyage, and Time the sea on which they are sailing;" consequently, we do right to heed the admonition—

"Give thy mind sea-room; keep it wide of Earth,
That rock of souls immortal: let loose thy cord;
Weigh anchor; spread thy sails; call every wind;
Eye the great pole-star; make the land of life."

Our voyage, then, will terminate with a delightful prospect in full view.

"Land ahead! its fruits are waving
On the hills of fadeless green;
And the living waters, laving
Shores where heavenly forms are seen."

ON THE NEW MODE OF CHEMICAL ANALYSIS.

Towards the close of the last volume we directed the attention of our readers to the new and beautiful spectrum-analysis process, stated to have been discovered by Professors Bunsen and Kirchoff, of Heidelberg. It would, however, appear that to others the method had before suggested itself, and it had been investigated, in a more or less perfect manner, especially by Mr. H. Talbot in 1826, and Mr. Wheatstone in 1835; the first named having read a paper on the spectrum colours, at the meeting of the British Association for the Advancement of Science, held in Dublin that year. Messrs. Herschel and Brewster had also before experimented on coloured flames.

In a lecture delivered by Professor Roscoe at the Royal Institution of Great Britain, in March last, he thus speaks of the advantages and delicacy of this process; having previously eulogised Messrs. Bunsen and Kirchoff, described their apparatus, and exhibited its capabilities by mixing together several metallic salts, and showing their different colours on a screen:—

"In order to give some opinion of the value of this kind of analysis, I would tell you that the various processes which the chemist must pursue in in the ordinary way in order only to detect the presence—not estimate the quantity, but simply to detect the presence—of these five or six alkaline metals when they are mixed together, occupies from two to three hours. And, what is more important, the results by these means are never absolutely certain, especially if there is only a small quantity of a substance present. As a contrast to this I will quote the following. M. Bunsen in his most interesting paper, said:—'A mixture of the chlorides of sodium, potassium, lithium, calcium, strontium, and barium, containing at most one-ten-thousandth part of a grain of each of these salts, was brought into the flame, and the spectra produced observed. At first, the bright yellow sodium line Naα appeared with a back ground formed by a nearly continuous pale spectrum. As soon as this line began to fade, the exactly defined bright red line of lithium Liα was seen; and still further removed from the sodium line, the faint red potassium line Kα was noticed, whilst the two barium lines Baα, Baβ, with their peculiar form, became visible in the proper position. As the potassium, sodium, lithium, und barium salts volatilised, their spectra became fainter and fainter, and their peculiar bands one after the other vanished, until, after the lapse of a few minutes, the lines Caα, Caβ, Srα, Srβ, Srγ, and Srδ, became gradually visible, and, like a dissolving view, at last attained their characteristic distinctness, colouring, and position, and then after some time became pale and disappeared entirely.'

"Thus we get, with absolute certainty, in half a minute, what, according

to the old method, was obtained somewhat doubtfully after three hours' hard work. [The lecturer proceeded to illustrate the phenomena describe by Bunsen, by the aid of the oxyhydrogen lime light, running through the description of the phenomena again.] But this application which I have mentioned is, however, by no means all that this method can accomplish; it cannot only do that speedily and easily, which we find a difficulty with other methods to perform, but it can do for us that which the old method never could. We can detect by this method quantities of the substances the smallness of which is perfectly astounding. Choosing from a number of beautiful examples which Bunsen gives us in his paper, I would refer you to this diagram, on which I have marked some of the most important, to show the delicacy of the spectra analytical method. 'Soda: $\frac{1}{3000000}$th part of a millegramme, or $\frac{1}{180000000}$th part of a grain.' These numbers seem almost absurd. I can scarcely tell you to-night how they were determined, but, in order to show you how delicate the process is, if we burn a piece of sodium weighing, say the $\frac{1}{10}$th of a grain on a piece of paper, we allow the vapour to diffuse itself throughout the room. Supposing the whole of it went up in vapour, you would have to see how much of that sodium was present in every cubic foot of the air in this room. Then you must know how much air each of these gas lamps requires to burn a certain quantity of gas in a certain given time—for instance, five minutes; then bring it down to the time required to take an observation, say two seconds, and in that two seconds you will see there must have been a minute fraction of the $\frac{1}{1000}$th part of a grain present in that volume of air. In this way, which is a sort of rough description of the method which Bunsen used, he arrived at this astounding fact, that the $\frac{1}{3000000}$th part of a millegramme, or the $\frac{1}{180000000}$th part of a grain of soda can be easily detected. Soda is always present in the air; all bodies exposed to the air show the yellow soda line. If a book be dusted near a flame, the soda re-action will be seen. If we leave a piece of platinum wire out in the air for an hour or two, it will no longer impart no colour to the flame as the platinum wire did before, but it will give us the soda flame. If I pass it through my finger you will see the same result,—the yellow flame indicative of the presence of soda, which the platinum wire has taken from my finger.

Of lithia: $\frac{1}{100000}$th part of a millegramme, or $\frac{1}{6000000}$th part of a grain, can be easily detected. Lithia was formerly only known to occur in four minerals. It is now found by spectrum analysis to be one of the most widely distributed elements. It exists in almost all rocks, in three cubic inches of sea and river (Thames) water; in the ashes of most plants, in milk, human blood, and muscular tissue. An experiment which Bunsen is very fond of showing is that of holding the end of a cigar (which our German philosophers generally have at hand), in the flame. You cannot see the lithium flame produced by it with the naked eye, but it is quite plain when we look at it through a prism."

By the above extract it will be seen that the process is marked by extreme delicacy or capability of detecting almost inappreciable quantities of matter; Bunsen having demonstrated the existence of one of the new metals thus discovered by him, namely, cæsium, when one part thereof was mixed with a hundred million parts of another substance. By it, also, we are enabled to obtain a knowledge of the composition of the earth's crust with a degree of accuracy

of which before we had no idea. Some of the chemical elements supposed to be most rare are found to be widely distributed, while their number is being augmented by it. The statement so often made, that iodine and bromine exist in the atmosphere, and are consequently present in rain-water, is rendered more than doubtful from the fact that Dr. Gladstone has failed to detect the lines indicative of them in 950,000,000 parts of air. But what almost staggers belief is the position that, "its influence outstrips the bounds of our planet, enabling us to determine with all the accuracy and certainty of exact experiment, the presence of certain substances well known on this earth—for instance, iron, sodium, and potassium—in the sun." Thus the composition of that luminary has been ascertained, and also of the fixed stars. The presence of other metals, as magnesium, chromium, and cobalt, have been likewise shown to pervade the planetary system, and these accumulating, fall on the earth in the form of aërolites. By its aid even gaseous bodies have been made manifest, and the light of the late comet was analysed by Mr. W. Crookes, who found it to be comparable to weak solar light. We have before noticed his discovery of a new metalloid, probably belonging to the sulphur group. This he has again examined, and being confirmed in the view he at first took, he proposes to give it the provisional name of *Thallium,* from *thallus,* a budding twig—a word which is frequently employed to express the green tint of vegetation—and chosen by him on account of the peculiar green tint it communicates to the spectrum. He has likewise indirectly shown that when water is thrown in inconsiderable quantities on certain incandescent bodies it becomes decomposed, and being resolved into carbonic oxide and hydrogen, the combustion going on is thus accelerated. This is a question of some practical worth, since it follows, that if the volume of water thrown on a burning body—as in large fires—be not considerable, instead of extinguishing it tends to increase the flame.

As yet, perhaps, these discoveries are only in their infancy. This mode of analysis has certainly been seized

with avidity by the scientific world, and extensively applied. Some have thought that it heralds the birth of a new kind of terrestrial and stellar chemistry, but it remains to be proved that we have in it all that is necessary to demonstrate the whole of material existence. Doubtless a splendid and a wondrous field is opened up by it, and science teaches us to be neglectful of nothing, since the smallest beginnings often eventuate in large and useful results. Speaking of it, Mr. Crookes says, "Chemists can now analyse, in the most rapid and accurate manner, almost everything which is visible to the human eye. It matters not whether the body possesses a tangible substance or not, whether it is close at hand in a test-tube, or millions of miles away; if it only fulfils the one condition of emitting light, it is almost certain to reveal the secrets of its composition when submitted to the new development of spectrum analysis."

When we penned our first article on this subject, we combated the opinion that colour-tests were objectionable. We are free to confess that when we did so, we were in ignorance of colour-blindness being so general. We have since read that the late Dr. Wilson paid special attention to the subject of colour-blindness. The results at which he arrived may not, however, be familiar to all. In one year, we are told that he examined no fewer than 1154 persons with reference to their appreciation of colour, and afterwards many more, and that he found no smaller a proportion than one in fifty so blind as to be unable to distinguish between red and green, while one in twenty was pronounced of imperfect power in this particular. Further, he pointed out the practical bearing of his researches on railway and other signals, suggesting as useful precautions the examination of signalmen as to their ability to distinguish colours, and also the addition of form and number to railway signals. It is also worthy of mention, that the colours most generally confounded by the colour-blind have been chosen for important signals both by land and sea. Still we do not consider this a valid objection. Some persons have no ear for the sweet harmony of sounds: they cannot distinguish one tune from another. To others the most fragrant odours are offensive,

and even injurious: they "die of a rose with aromatic pain." Are these, therefore, to be discarded and denounced, because of the imperfect senses or peculiarities of some persons? Leaving this, we would, in conclusion observe, that by some persons it might be thought that so highly a scientific, and even recondite subject as that we have been descanting on, affects not the veterinary profession, and is consequently unsuited to our pages. With such we take leave to differ, for we believe that the time has arrived when the members of our profession need all the aids the sciences can give, especially those allied to medicine; it therefore follows that they must be made conversant with whatever is taking place connected with them, and no one for a moment will gainsay the advantages to be derived from an application of the principles of chemistry, and especially the modes of analysis.

Extracts from British and Foreign Journals.

ON INDIAN HEMP.—*CANNABIS SATIVA.*

By Dr. Fronmuller, of Fuerth.

[The following article appears in the *North American Medico-Chirurgical Review.* We extract it because we are enabled to bear out the observations of the writer, as to the difference in action of this drug on the lower animals in this country and India. Our professional brethren there are sometimes in the habit of successfully employing it in cases of tetanus, for which disease it has proved here of but little worth. There remains much in connexion with this agent, on which we think some light might be thrown by our friends in India. Dr. Fronmuller, who writes for the human subject, considers that some ethereal ingredient in the Indian hemp is destroyed by transport; and when he says it "has become known but lately," we presume he refers to his own country.]

Indian hemp has become known but lately. First welcomed as a new narcotic remedy, it seems to have been abandoned again on account of its uncertain and weak effect. This is at least the case in Germany and France, and the causes of it are easily found. The contradictions of the authors are dis-

couraging. Rigler, for instance, observed an accelerated circulation after the use of haschisch; Sigismund, a diminished frequency of the pulse; Ley found an exciting effect on the sexual organs; Scanzoni denies it; some saw contraction of the pupil, others not, &c.

It is further a fact, that the effect of hemp in the East is quite different from the effect it produces in Europe; what can be effected in Calcutta or Algeria with one or two grains, requires in Europe thirty or forty times as much. Two grains are considered at Cairo a large dose; with us, eight grains are the smallest dose. There is probably some ethereal ingredient in the Oriental hemp which is destroyed by transport. Many practitioners hesitated to increase the doses sufficiently for the desired operation. Having once employed the remedy, I made up my mind to ascertain the truth, and continued my experiments until they embraced one thousand cases. But before giving the result, I will shortly refer to the plant and its therapeutical exhibition.

The external appearance of Indian and European hemp is the same, as are their botanical characters. The differences described by many authors are probably due to local causes only; the only real difference is the quantity of narcotic resin which is secreted by particular glands—like the lupulin, in the hop plant. This resin exudes, in India, from the flowers, leaves, and stalks, and is known there by the name of *churrus*. Its quantity increases with the southern direction.

The hemp cultivated in Edinburgh by A. Christison exhibited no churrus; plants collected in Regent's Park, by Ley, contained about one tenth as much resin as their Oriental sisters. French and German hemp appears to be richer in resin; the hemp growing in Italy still more so. Greece and Asia Minor furnish quite a powerful product; but by far the strongest is from Persia and India, although even there variations are found according to the soil. The quality of the resin seems to be subject to a similar variation, showing the same difference as rhubarb, roses, and poppies do in different climates. All of them require the rays of an Asiatic sun for the full development of their powers.

Asia is evidently the native country of hemp. This is proven by direct statements, by its being frequently mentioned in the history of Oriental nations, and by the very derivation of the name: Cannabis, Kannabis, from the Kanub—Ganja of the Arabs. (Ainslie, *Mat. Ind.*, vol. ii, p. 190). From China, India, and Persia, the cultivation of hemp spread to Egypt, over Africa to Europe and America, the fibres and the oil recommending the plant.

Already Homer speaks (*Odyssey*, N., 220-230) of the exhilarating effects; for this is undoubtedly meant by the *Nepenthes* which caused all suffering to be forgotten. Helena received it from Egypt, and there hemp was long esteemed on account of its intoxicating quality. (Prosp. Alpin., *de Medic. Ægypt.*) Even to this day hemp wine is used by the Orientals for the purpose of intoxication. Herodotus mentions cloths made from hemp, and refers also to fumigations used in Scythia. Galenus was well acquainted with the narcotic effects of haschisch; and in a Chinese work, now in the great library of Paris, it is stated that a Chinese physician, Hoa-Tho, living A.D. 220-230, administered to patients he wanted to operate on a medicine prepared from hemp, and made them in that way insensible. Rigler says a preparation of hemp has been used for the same purpose in India since times immemorial; it is there called *Esrar—i.e.* secret. During the Crusades, a Persian, Hassan Ben Ali, famous for the number and fanaticism of his soldiers, used haschisch to intoxicate and excite them, so that all over Asia Mahommedans as well as Christians trembled before them. These fellows—exterminated in 1256 by the Mongolian chief, Hulakan Khan—received, from their using haschisch, the name of Haschischin, Haschaschin. By perversion, that word changed into assassin.

For the sake of the narcotism alone, hemp is extensively used at present in a great part of Asia, Africa, and South America, either smoked (in Algeria, Morocco, by the Hottentots and Brazilians), or in the form of electuary, confection, tincture, pastiles, &c. In spite of the Crusades, this narcotic quality of hemp was not known in France until after the campaign in Egypt. England received the first notice of it through her physicians practising in the East Indies. In Germany, Dr. Molwitz pointed out hemp, in 1818, as a substitute for opium; Hahnemann employed it against affections of the nervous system. Since 1830 a large amount of information, regarding especially the power and qualities of the Indian hemp, has been published, mostly by English and French physicians.

The few chemical analyses made of the hemp plant, show in it a gum, a bitter extractive matter, albumen, chlorophyll, ethereal oil (about twelve drops in twenty-eight ounces), and a resin called by some *cannabin*, which appears to be the effective ingredient. No alkaloids have been found so far.

The more important preparations which have been employed are: for internal use, the powdered herbs, in pills or powder; Oriental haschisch—a mixture of the foregoing

with ginger and cinnamon, in different proportions, therefore not very reliable, may be imitated by mixing the powder of the leaves with sugar and mucilage of gum tragacanth, so as to form cakes—the resinous extract, best in pills; a tincture made by dissolving the extract in ten to twenty parts of alcohol, and an emulsion of the resin. Churrus, the pure exudation of the plant, is used like the extract, but rarely met with in commerce. Externally the resin is applied endermatically, or in the form of embrocation, with oils, ointments, chloroform, &c.; also in injections.

Physiological experiments on healthy persons, instituted by Landerer, Beron, Rech, Wolff, Judee, Schroff, myself, and others, show more or less disturbance in the digestive tract; affection of the nervous system, with convulsive movements and sudden shocks; congestion to the brain; confused ideas; excited imagination, with frequently changing pictures; torpor, and sleep—the cerebral symptoms being more constant, while the others vary to a great extent, sometimes nothing being mentioned but a few confused ideas, followed by sleep. Fumigations with haschisch produced in two consumptive patients, first, some excitement, then a short sleep, without any important narcotic symptoms afterwards.

The effects of hemp are combated by the same means as those of opium; vegetable acids, coffee, emetics, cold applications, leeches to the temples. Landerer recommends sea-water, Cayenne pepper, salted victuals, caviar, strong coffee, and, as an emetic, the sulphate of copper. At Vienna, lemonade and coffee proved of good service. O'Shaughnessy gave acids in large doses.

The long-continued use of Indian hemp induces prostration, dropsy, and sometimes a liability to sudden fits of mania, with great inclination to destroy and ruin. This, however, I think more ascribable to the alcohol mixed and taken with the haschisch, than to the latter. The cataleptic fits of the Indian jugglers are also explained through the agency of hemp, though it occasions such fits extremely seldom.

During the short time since its use as a medicine has become known in Europe, hemp has been extensively employed, and mostly as a calming, antispasmodic remedy.

[Various diseases are enumerated in which the remedy has been exhibited, and the author concludes with the following results of his experience:—]

As an external remedy, I have used hemp many hundred times to relieve local pains of an inflammatory as well as neuralgic character.

Judging from my experiments, I have to assign to the

Indian hemp a place among the so-called hypnotic medicines, next to opium; its effects are less intense, and the excretions are not so much suppressed by it. Digestion is not disturbed, the appetite rather increased, sickness of the stomach seldom induced, congestions never. Hemp may consequently be employed in inflammatory conditions. It disturbs the expectoration far less than opium. The nervous system is also not so much affected. The whole effect of hemp being less violent, and producing a more natural sleep, without interfering with the actions of the internal organs, it is certainly often preferable to opium, although it is not equal to that drug in strength and reliability. An alternating course of opium and Indian hemp seems particularly adapted to those cases where opium alone fails in producing the desired effect. —*Prager Vierteljahrschrift*, xvii, 1860; and *North-American Medico-Chirurgical Review.*

ON THE IMPORTANCE OF THE STUDY OF CHEMISTRY.

By A. W. Hofmann, LL.D., F.R.S.

Dr. Hofmann in a lecture on this subject, lately delivered at the South Kensington Museum took as principally illustrative, the influence that the manufacture of sulphuric acid and coal gas has exerted on the progress of civilization.

To those who have not given the subject consideration, they will be surprised to see how these two branches of industry ramify, and the results that have unexpectedly followed. He says:

In taking a retrospect of the rapid progress which some of the arts and manufactures, depending upon chemistry, have made in modern times, we are at a loss to know where to begin our survey, every branch of industry could furnish the most brilliant illustrations. Were I to trace with you the history of sulphuric acid, from the moment when the Erfurt monastery first witnessed oil of vitriol passing over, drop by drop, from the alembic of Basilius Valentinus, up to the present time, when hundreds of thousands of tons are sent forth from the colossal lead-chambers of Great Britain alone; were I to enlarge on the influence which chemistry, by raising the production of sulphuric acid to its present degree of perfection, has exerted on the development of chemical manufactures; were I to describe the action of sulphuric acid in the preparation of the other acids, of nitric, hydrochloric, of acetic acid; its application in the manufacture of phosphorus, its employment in the improved process of candle-making, in the isolation of stearin from crude tallow, its use by the dyer for preparing his colours, by the skin-dresser for opening the pores of the skin previous to the operation of tanning; by the metallurgist in the new process of refining silver; by

the agriculturist in the preparation of most efficient manures,—I should have to unfold a picture for which it would be difficult to find the appropriate frame. Nor could I omit to show you Leblanc struggling with prejudice for the adoption of his great discovery: the transformation by the agency of sulphuric acid of sea-salt into carbonate of soda; or to lead you into the busy factories of Lancashire, which now, after the lapse of less than half a century, provide not only this country, but half the world, with soda. Nor would the picture be complete without the glassworks and the soap manufactories in the distance, the operations of which have been forced into unprecedented activity by the production of soda, without the bleaching yards, which owe their very existence to Leblanc's great discovery!

It would be equally instructive to trace, in brief outlines, the history of coal gas, the manufacture of which has become, during the last thirty years, of truly national importance.

The evolution in different localities of inflammable gases from the ground has been noticed from time immemorial, and the connexion of these gases with deposits of coal had been recognised as early as the middle of the seventeenth century.* Years, however, elapsed before correct views of the nature of these gases were established by experiment. In 1739, coal was for the first time subjected to distillation by Dr. Clayton, Dean of Kildare, who thus succeeded in imitating artificially the formation of native gas. From this moment the subject was never lost sight of, but it was not till the end of the last century that the intellectual impulse of that memorable period overcame the difficulties opposed to the practical application of this new source of light. These obstacles we know have been at last entirely removed, gas light is now universal. Our streets, our public buildings, our private dwellings, are brilliant with its radiance. In our daily enjoyments of its benefits, we have almost ceased to be conscious of the comfort and even personal security, which we owe to this, as yet, the best, cheapest, and safest of lights.

But, to the attainment of this end, how many were the scientific problems to be solved, how often had the gas-maker to seek the assistance of the scientific chemist, and to avail himself of the results of his researches, instituted originally perhaps for very different purposes! What a difference between the gas with which Mr. Murdoch lighted up the Soho Foundry in Birmingham, and that now circulating in the arteries of our nightless towns!

The gas produced by the distillation of coal is not an uniform substance. Together with the principal illuminating constituents, light carbonetted hydrogen and olefiant gas, many other gases are evolved during the distillation, some of which, *e. g.* hydrogen, tend rather to diminish the illuminating qualities of the gas, whilst others, as ammonia and sulphuretted hydrogen are injurious to health. This formed a serious obstacle to the adoption of coal-gas as a domestic light. By the aid of chemistry, the composition of coal-gas was ascertained, and the nature of its constituents, useful and deleterious, determined. Founded on the knowledge thus obtained, means were devised for the separation of the latter; the temperature was indicated, at which the purest gas comes over during the process of distillation, whilst for the improvement of gas less rich in illuminating constituents, the beautiful and economical process of naphthalisation was suggested. And, finally, simple and elegant burners were contrived for the safe and economical combustion of the product.

The extent to which the use of gas has affected the arts and manufactures in this country can only be conceived by those who are aware of its innumera-

* Mr. Shirley's experiments on the burning well of Wigan, in the 'Trans. of the Royal Society' for 1659.

ble applications in the double capacity of giving heat and light. The benefits afforded by gas to our experimental chemists cannot be overrated, more especially in England, where the price of sprits of wine was at one time so exorbitant. But for the use of gas in the laboratory, the progress of chemistry in this country must have been greatly retarded.

In speaking of the general influence of the manufacture of coal gas, it is impossible to leave unnoticed the number of hands daily engaged in raising whole strata of coal, and in loading and navigating the flects employed in conveying it, not only to the different ports of this kingdom, but to foreign countries, which consume a much larger quantity of English coal for the production of gas than is generally known. The extension of the gas enterprise produced a sensible effect on the iron works by the vast number of retorts, the stupendous gas-holders, and the endless pipes, required for generating, storing, and conveying the gas. Several other branches of trade were also forced into increased activity, and even new trades sprang up in consequence of the extended use of gas. The substances produced in the purification of gas naturally attracted the attention of the gas manufacturer; and chemistry soon pointed out valuable purposes to which they might be applied. The oily matter, which is separated as a secondary product in the distillation of coal, has been the subject of various chemical researches, amongst which must be singled out the elaborate* investigations of Charles Mansfield, a young chemist of extraordinary promise, whom a cruel fate tore away too early from science and his friends. His researches showed the more volatile portions of this oil to consist chiefly of benzol, an interesting compound discovered some years previously by Faraday. The history of benzol alone and its uses would fill a little volume. Capable of undergoing in the hands of the chemist an endless number of Proteus-like transformations, this substance has not only assisted the progress of science itself, but given rise to new and important branches of industry. Let me remind you that benzol is the most convenient solvent for caoutchouc; that, as an agent for removing oil and grease, it has become an ordinary household article; that, in perfumery and confectionery, we use it as a substitute for the essential oil of bitter almonds. Let me remind you, lastly, that, converted by a succession of chemical processes into aniline, it has given rise to the production of those beautiful mauves, purples, and crimsons in which the lovelier portion of mankind is now indulging to the exclusion of almost every other colour. Nor have the other products of the distillation of coal, which accompany the benzol, proved less useful: the liquid distilling at a very high temperature was found to be an efficient preservative of timber, and the pitchy residue formed the chief ingredicnt of an excellent substitute for the flag-stones of our pavement, while the ammoniacal liquors were found useful in improving the fertility of land. Thus, after the lapse of countless ages, was the nitrogen of petrified fern forests resuscitated in the ammoniacal liquors of the gas-works, to vegetate once more, and increase the produce of our corn-fields.

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* Charles Blachford Mansfield died (February 1855,) a victim of his scientific zeal, in consequence of an accident which happened to him whilst he was engaged in experimenting with benzol. The memory of this young man, in whom intellectual powers of the highest order were wonderfully blended with the rarest gifts of the heart, will be cherished by all those who had the good fortune of meeting him during his short but useful carecr.—A. W. H.

Adverting to the alliance between agriculture and chemistry, Dr. Hofmann says:

To keep up the fertility of his fields, the cultivator of the soil had to make himself acquainted with its general composition, as well as with the nature both of the particular substances, which he is annually extracting from it, and of those with which he must supply the loss. For each of these purposes the aid of chemistry became indispensable to the farmer. Davy's excellent work on agricultural chemistry first called the attention of the more intelligent British farmers to the value of chemistry in the improvement of their art, but it is only within the last twenty years that the attention of agriculturists has been generally directed to the subject, more particularly by the works of Liebig and Boussingault. The nature of manures once clearly defined, almost every agricultural improvement at which practice had arrived by slow degrees, received a satisfactory explanation, whilst a variety of improved applications necessarily suggested themselves. The principles of fallowing and of the rotation of crops, and the theory of soil-burning, are no longer mysteries; the action of lime, of wood ashes, and of bones is now perfectly intelligible. In this country, too high a value cannot be set upon the discovery of new sources of material convertible by the farmer into human food. Chemistry has put us in possession of the excreted wealth, which centuries had accumulated in the islands of the Pacific; and if the means which it has suggested for preventing the enormous waste of valuable matter perpetually and irrevocably swept away by the Thames and others of our large rivers, have not as yet been perfectly successful, it has enabled us to substitute for natural manure, artificial products, for the components of which the refuse of every trade and manufacture is now carefully sifted. Perhaps there is no more striking illustration of the value of the aid which agriculture has derived from her new ally, than the success which of late has attended the search for mineral manures. This search, directed by the philosophical interpretation of a few isolated facts, has been rewarded by the discovery of considerable quantities of phosphate of lime in various parts of England; thus realising the prophetic anticipation of Liebig, that "in the remains of an extinct animal world, England is to find the means of increasing her wealth in agricultural produce, as she has already found the great support of her manufacturing industry in fossil fuel, the preserved matter of primeval forests, the remains of a vegetal world."

After this, we are brought to a section which perhaps will by some of our readers be considered the most important, although all are but as links in a chain, each giving to the other strength and contributing to the usefulness of the whole.

Nor is the increase of his vegetal produce the only object in the pursuit of which the farmer relies upon the counsels of the chemist; in the feeding and fattening of his animal stock, he stands in no less need of his instruction.

And here we may briefly allude to the benefits, which *physiology, pathology,* nd *medicine* in general, have derived, and must still further derive, from the prosecution of chemical inquiry. The investigation of the food of plants was followed by a no less vigorous scrutiny of the food of animals. The materials consumed by animals were shown to fulfil two distinct purposes in their economy, enabling us at once to separate into two distinct classes the substances supplying,—each respectively,—the aliments of nutrition, and those of respiration. In vegetal fibrin and albumen, we became acquainted with a group of nitrogenous compounds, which we find again in the animal

organism as the chief constituents of the blood. These materials, prepared by vegetal life, the herbivorous animal receives and assimilates into its blood, to supply the constituents of its different organs and structures.

Again, we have a series of substances, such as fat, sugar, gum, starch, &c., which, though not truly to be called nutriments, as having no part in the construction of the body, are no less essential to the maintenance of life. These substances serve the process of respiration; combining with the oxygen inspired by the animal, they continually compensate the loss of temperature, and thus become the source of animal heat. And here presents itself one of the most interesting subjects for contemplation,—the animal organism in its relation to the surrounding atmosphere. The full appreciation of the effect of air and temperature on the animal system, was a most important step towards a true understanding of the conditions of health. A vast number of diseases originate in disturbances of the relation between the living system and these influences, the intimate knowledge of which affords to the physician the simplest, safest, and most efficient means of preserving health and of curing disease.

Valuable as have been the fruits of chemical inquiry, still more may be expected from the further prosecution of this study. The notion that the action of most of our medicines is chemical, is daily growing into a general conviction. We admit that with every change wrought by pharmaceutical agents in the state of our organism, there occurs a corresponding change in its composition, resulting from their reaction on one or more of its constituents. But of these transformations, which doubtless could be expressed in numbers as definitely as can our laboratory-processes, how few are we in a condition to explain; in how few instances has the physician even a vague conception of the mode in which any medicine performs its office! Nobody doubts the power, which the principles of the Cinchona bark, or of tea and coffee, exert upon the living body, but we are perfectly in the dark as to the way in which they act upon the animal economy. But if we meet with a series of similar substances in several animal fluids; *e.g.*, *urea* and *creatine*, almost constantly present in urine, *glycocoll* generally, and *cystine*, occasionally, excreted in the same liquid, and if we find that all these substances exhibit in their chemical relations a close analogy with quinine and theine, we begin to feel a sort of anticipation of the manner in which these agents may act upon the system. Such examples illustrate at once the nature of the aid which the therapeutics may confidently expect from the progress of organic chemistry. Medicine some years ago found itself in a predicament very similar to that of agriculture at the same period; its resources appeared to be in a state of exhaustion, the rich capital of facts accumulated in the department of organic morphology by the industry of the anatomist, and by the acumen of the physiologist, could not yield its full fruits until an equivalent of knowledge had been drawn from the study of bio-chemical phenomena. This state of things, however, is rapidly changing; associated with chemistry, medicine no longer draws the veil of vitality over processes, the mystery of which may be unlocked by the key of analysis; it no longer shrinks from climbing, step by step, the ladder of recognition, because its upper extremity, disappearing among the clouds, seems to rise for ever beyond the grasp of inquiry. The special zeal with which the field of organic chemistry has been cultivated during the last thirty years, the simple and accurate methods which we now possess for determining the composition of organic products, the amount of analysis actually performed, and, more than all, the still untiring energy of the numerous labourers in the same field of investigation, hold out the promise that the connexion between medicine and chemistry, becoming daily more intimate, will be productive of benefits, the importance of which we can scarcely venture to estimate in the present state of our knowledge.

* * * When glancing, in a former portion of this lecture, at the benefits arising to agriculture and medicine from the progress of chemistry, I have already hinted at the inquiries which have for their object the examination of the chemical conditions of vegetal and animal life, and at the light which they have thrown upon the true nature of respiration and nutrition. I am inclined to look again at these inquiries from a different point of view. They have taught us that animal respiration is a true process of combustion; in order to secure the necessary warmth, we have to burn at every moment a part of our body; this source of heat lasts so long as we supply to the seat of combustion continually renewed fuel; so long as the alternation of breathing maintains the supply of the necessary amount of oxygen, and accomplishes the removal of the products of combustion, *i. e.*, of water and carbonic acid. With each respiration the animal robs the atmosphere of a certain quantity of oxygen, and introduces into it a proportionate bulk of carbonic acid. If we consider that the endless processes of combustion, carried out for domestic purposes and for the purposes of industry, produce the same effect; that, lastly, the transformations of organic matter, which we designate as putrefaction and decay, are, in many respects, nothing but processes of slow combustion: it is evident that the unlimited continuance of these conditions must gradually involve a change in the constitution of our atmosphere. Such a change has not yet been observed. It has been justly argued that the immense space of the atmosphere necessarily renders changes of this sort extremely slow, that our analytical methods are not sufficiently accurate, that our experiments do not extend over a sufficient length of time; nevertheless, who could fail to perceive that the compensation is furnished by the difference of conditions which govern the life of the plant in contradistinction to that of the animal? With its leaves, as with so many lungs, the plant withdraws the carbonic acid from the air. Under the influence of sunlight the carbonic acid splits into its constituents —the carbon is employed in building up the plant, whilst the oxygen is returned into the atmosphere. The plant is referred, for its support, to the compound which the animal ejects from its organism as no longer serviceable for the purposes of its life; but it requires only a part of this compound; the rest is set free, again to take part in the development of a new animal generation.

How simple and how wonderful are the means which Nature employs to fulfil her least, as well as her greatest designs!

A mine of interesting considerations is opened by the phenomena to which we have slightly adverted. The carbon of the plant is derived from the air, in which it exists in the form of carbonic acid. The carbonic acid is, as we have seen, partly furnished by the respiration of the animal; but in combustion as in decay a supply of carbonic acid no less inexhaustible is secured to the atmosphere. But with how new a signification do these processes become endowed when we view them in relation to vegetal life! Combustion, which suggests to the ordinary observer the idea of destruction—decay, which we are in the habit of considering as the symbol of death, in the eye of the chemist are but changes of form bearing the germ of a new unfolding of life. Of all the changes which surround us in nature how different are the views we take, when once the study of chemical phenomena has convinced us of the indestructibility of matter, when once we have accustomed ourselves to consider, as fixed and unalterable, the sum of matter which, under the influence of the forces of nature in the processes of vegetal and animal life, is capable of assuming so endless a variety of form!

Contemplations of even a higher order have been attached to this recognition. No one is likely to deny the danger of attempting to refer the conditions of spiritual life to the laws of the material world, still, this speculation, which appears so consonant to ordinary conception, has been at all times

indulged in. If in the gradual development of the cell, of the organ, of the animal,—each phase of which, although fulfilling a definite purpose of the present, nevertheless points to a future end as yet unfulfilled,—physiologists have seen but a special case of a much more general law, which governs likewise the unfolding and ultimate destiny of the human mind;—can we wonder that in the indestructibility of matter (the medium in which all these transformations are accomplished without a particle of it being lost),—chemical philosophers should with delight have imagined they had found a measure applicable to spiritual life, and that indestructibility of matter thus became to them a symbol of the immortality of the soul?

Thus we see emanating from the results of chemical inquiry a rich vein of considerations such as must be acceptable to every thinking mind; but these considerations are by no means limited to objects of general interest. No department of knowledge,—no branch of study,—can be imagined, but what might draw from the stores of chemical experience important solutions and significant suggestions. We find abundant proofs of this assertion in the chemico-agricultural, and chemico-physiological inquiries of Liebig, the general results of which are embodied in his admirable 'Familiar Letters on Chemistry.' The merchant, the political economist, the statesman, the ethnographer, the historian, each of them finds in this book numerous questions, in which he takes a lively interest, elucidated from the chemical point of view.

Referring to the influence of mathematical pursuits in developing the mental powers, he says:

No one can deny that the precision of thought, the correct inference from given premises, essential to progress in mathematics, gradually becomes a habit, which is soon transferred to intellectual labour of any other kind. The mathematician starts from certain fundamental truths, which, without external aid, he is capable of elaborating out of his own mind; and on this basis he piles up, step by step, the wonderful edifice of his science. It is this nature-like mode of construction, disdaining to raise another stone before the previous one is thoroughly secured, which constitutes the value of mathematics, as an element of mental-training.

The pursuit of Chemical studies involves no less the development of the mental powers; it leads no less to precision of thought; it improves no less the habit of drawing correct conclusions, which, once acquired, is as easily transferred to other fields of mental labour. Chemistry, as a science, differs essentially from mathematics in this one respect,—that the truths which are its foundation cannot be drawn from the human mind itself. These truths are external to our mind, and can only be obtained by careful observation of the outer world; but, once our mental property, these experience-gathered truths afford a foundation equally adapted for the nature-like unfolding of a system of conclusions, which are not less logically linked together than the conclusions of the mathematician. The chemist has, however, this advantage over the latter:—whereas the mathematician has to find the guidance of his steps within himself, the chemist possesses in nature a mirror which, duly questioned, at every moment readily informs him whether he is still advancing in the right direction.—(*Abridged from report of the lecture in the 'Chemical News.'*)

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Clinique Vétérinaire, November, 1861.

ON VOMITING IN THE HORSE, &c.

By M. Romaut, Vétérinaire.

If vomiting in the horse, observes the author, is always a dangerous symptom, and often followed by death, it would, nevertheless, be bold always to give this as a decided opinion, for in some cases, and under certain circumstances, a cure may be effected. He reports two cases to prove the truth of this observation. The subject of the first was a bay mare, nine years old, which, according to the information of the proprietor, had been taken to water at the public watering trough, and where she was allowed to drink a large quantity of cold water. On reaching the stable she lay down, and after a few moments got up and made strong efforts to vomit, which she effected, bringing up a quantity of slimy liquid through the nose and mouth.

Symptoms.—On the arrival of the author, the animal was found standing; her head low, her mouth and nostrils covered with slimy matter, resembling the white of eggs, the ground and the manger were also covered with it, and in it were seen particles of food. The animal made almost continually feeble efforts to vomit, which was effected by the contraction of the abdominal muscles and the sternal ribs; and it was by these feeble efforts, continued almost without interruption, that this slimy substance was brought up. The visible mucous membranes were injected, and the pulse small and accelerated.

After this cursory examination a handful of lucern was given to the animal, as an experiment. To the great satisfaction of the author, the animal took it, and slowly swallowed it, after a short mastication. In a minute or so after, she stretched out her neck, the abdominal muscles contracted suddenly, the head was brought close to the chest by a sort of jerk, the mouth was opened, and a quantity of semi-fluid aliment, having an acid smell, was brought up, principally through the nose; this was mixed with the above-named slimy matter,

in which could be easily detected the débris of the handful of lucern which had been previously given. The same experiment was tried with some wet bran, and with the same result.

The diagnosis was unfavourable and uncertain, as the cause might be a rupture of some vital part, or a valvular invagination of the intestines; but the absence of any abdominal pain or colic, or any other sign of a serious organic lesion, could not lead to this supposition.

Prognosis grave, unfavourable, and uncertain.

Treatment.—This consisted in the abstraction of three kilogrammes of blood from the jugular vein and the application of a sinapism under the chest, friction over the whole of the body, warm drinks, and restricted diet.

Two hours after the bleeding the vomiting ceased, and the animal also partook of a little wet bran, which was not returned. On the next morning, on visiting the mare, she was found quite well.

The subject of the second case was a gelding, six years old. The information obtained from the proprietor was that his horse had eaten his ration with avidity, after which he drunk a quantity of cold water, and a short time after he made violent efforts to vomit. This was attributed to something having got accidentally into the alimentary tube.

Symptoms.—The animal, on the arrival of the author, was found standing perfectly quiet, without exhibiting any signs of distress, attentive to the voice of its master, and smelling at whatever was held to its nostrils; the appetite, however, was lost, as the rack was full of lucern; the temperature of the body was augmented; the pulse small and quick; the respiration somewhat increased; the mouth hot and covered with slimy mucus, and the nostrils besmeared with a similar substance; the manger contained a large quantity of the same liquid, which was without any peculiar odour, and resembled the white of eggs in colour, aspect, and consistence. This, according to the statement of the owner, had been ejected from the mouth and nose of the animal. The mouth and the œsophagus, as far as the examination could be made, presented no alteration or obstruction. After this examination the author watched the patient for fresh symptoms, which soon appeared, for he began to be very uneasy, to paw, and show indications of slight colic. This lasted a few seconds only; he then stood quiet, elongated his neck, thrust out his head, and drew the latter back to the chest, at the same time there was a sudden contraction of the abdominal muscles. During these painful efforts, which were repeated

several times, the mouth opened, the nostrils became dilated, and a quantity of whitish, slimy fluid was brought up, which was accompanied by a peculiar noise. The quantity thus brought up was not more than half a litre. It contained hardly any particles of food; nevertheless the acid odour, and the violent efforts made, left no doubt as to the nature of the attack. After this the respiration as well as the circulation increased, although only for a short time. Three or four minutes after this the same phenomena followed in precisely the same order, and were each time accompanied by the expulsion of a greater or less quantity of the same slimy, semi-fluid substance.

The author, in this case, as in the former, wished to assure himself of the reality of the vomiting; he therefore ordered the patient some wet bran, and after that some bread, but he obstinately refused to partake of either, for, although he took several pieces of the bread into his mouth, he neither masticated nor swallowed them.

Treatment.—Bleeding was prescribed; but as the owner was a dealer, and wished to sell his horse as soon as he could, this was not carried out; but dry frictions were made over the whole of the body, and some sedative drinks administered. Half an hour after, the vomiting had become less frequent, and in an hour it had ceased altogether.

The same evening the horse began to feed, and the next morning all signs of vomiting had disappeared.

ON THE SHEDDING OF THE MOLAR TEETH IN THE HORSE.

By M. Delplanque, Vétérinaire à Douai.

"Was Ruini right when he announced, in 1598, that of the six premolares, two only were shed on each side?" And "Was not Tenon wrong, when he advanced, in 1797, that the three were susceptible of being shed and replaced?" This was the question which was put in the last number of the *Recueil Vétérinaire.* M. Genée, Vétérinaire à Dole, does not hesitate in solving it in the favour of Ruini, by affirming that the horse has eight shedding premolares, four on each side of the mouth; that this transformation of the teeth takes place in the winter, before the horse attains his third year, and that at that time great care must be taken of the animal in a hygienic point of view.

With this M. Delplanque, of course, does not agree, as

this has long since been elucidated, and his own observations agree with those of M. Genée, which are stated in the treatise on the age of the horse, and adopted by the authors of that work.

At page 31 in the work 'On the Age of the Horse,' we read the following:—"The premolares, three on each side, have been long, on the authority of Aristotle, considered as permanent. Buffon, Bourgelat, Daubenton, &c., considered them as such, notwithstanding that Ruini, in 1598, announced that two of them were shed. This error was persisted in until Tenon, in a peremptory manner, asserted the fact to be the contrary—that they are all three caducous."

Archiv für Thierheilkunde von der Gesellschaft Schweizerischer Thieräzte. Zürich, 1861, von R. Zangger.

('Archives of Veterinary Matters, by an Association of Swiss Veterinary Surgeons.')

AN ESSAY ON INDIGESTION IN THE RUMINANTS.

The author divides indigestion in the ruminants into two parts,—namely, 1st, with meteorization; 2nd, without meteorization. The first, he says, depends on the appendages to the true stomach, and may either be acute or chronic. The second is dependent on the fourth stomach and intestines, and is more or less accompanied by colic or diarrhœa, and sometimes vomiting. Obstruction in the third division, or omasum, is by the vulgar considered as a frequent cause of indigestion. By frequent examination of healthy beasts slaughtered at the butchers, the author shows that the contents of it are often dry and hard; and, on the contrary, he has had animals killed who had suffered from chronic meteorization, in which the contents of the omasum were found soft. It is curious to find amongst the predisposing causes of indigestion, turnips and other succulent roots. According to the author, they are too relaxing, and weaken the digestive organs. He also condemns cut fodder as ill adapted for rumination, which is a necessity to the well-being of these animals. Cooked food, and the refuse of distilleries, breweries, &c., when given in too large quantities for fattening, are likewise, he says, a frequent cause of indigestion, but the most immediate one is a retention of food in the rumen, or either in the rumen and the omasum at the same time. This, at the beginning of the attack, is only a mechanical obstruction,

which he explains in the following manner—when the food reaches the rumen from the œsophagus, it goes directly into the second compartment, thence into the third or the posterior right division of the rumen; this is the more easy, as that part which is contiguous to the reticulum is, in its position, anterior to the opening of the œsophagus itself, and in the act of swallowing, it stretches still further into the volume of this viscus, while the prominent pillars or bands greatly contribute to the progress of the food in this direction; thus it reaches the inferior right *cul de sac* of the rumen (it is worthy of notice that, on account of the diminished capacity of this sac in sheep, they are less subject to this affection); from thence the food progresses upwards and to the left into a similar blind sac, and in this manner it reaches again the opening of the œsophagus, but at this part the unruminated food is prevented, by the short pillars and semi-lunar fold of the mucous membrane, from finding its way into the reticulum or second stomach, and is by that means guided into the opening of the œsophagus to the mouth to be masticated. That is the direction the food follows, and which is effected by a sort of peristaltic motion, beginning at the spot where the coat of the rumen forms an adhesion about the size of the palm of the hand with the upper parietes of the abdomen, opposite to the place where the longitudinal and cross-columns or bands meet. When the food has arrived in the left portion of the rumen it advances gradually towards the œsophagus, and this is effected principally by the raising and falling motion of the viscus, aided by the papillæ on the mucous membrane, which for this purpose have their points directed forward on the left side, while on the right they point backwards and downwards, thus indicating the course in which the food progresses through the rumen to the opening of the œsophagus, whence it is taken up into the mouth and masticated. Any disturbance of this order of things in the rumen causes meteorization and all its consequences.

Jahresbericht über die Verwaltung des Medizinal-wesens die Offentlichen Krankenanstalten und den Allgemeinen Gesundheit Zustand des Kanton Zürich im Jahr, 1860.

A REVIEW.

THIS little volume, which has been forwarded by R. Zaugger, Director of the Veterinary School, the editor of

that portion relating to veterinary medicine, is a report of the state of the medical and veterinary establishments in the Canton of Zürich, Switzerland, with a general statement of health during the year 1860.

One pleasing feature in this report is that the veterinary department forms a not unimportant part of it. It contains an account of all the epidemic and epizootic affections which occurred in the year, with interesting cases that have taken place in private practice, as well as those which were in the hospitals and veterinary establishments. It contains also a barometrical and thermometrical account as to the state of the weather, the direction of the wind, &c., during every month in the year.

In looking to the report of the veterinary school, we find that 438 patients were admitted, viz., 247 horses, 2 foals, 4 beasts, 30 sheep, 7 goats, 2 pigs, 138 dogs, 7 cats, and 1 fowl. Out of which 349 were cured, 30 were incurable, and 59 died or were ordered to be killed. The total number of days they were in the infirmary of the school was 7582, at a cost of 8716f. 55c. for medicine and keep.

The author observes that it is remarkable that only two cases of typhus occurred in the horse during the year. The majority of cases terminating fatally were inflammation of the lungs. This, however, is not to be attributed to the frequency of the malady, but more to the delay of the owners in not applying for medical aid before the disease had progressed too far. Of 31 cases of colic, 2 died. On a post-mortem section being made, in one neither inflammation nor any other cause of death could be discovered; in the other the stomach was ruptured. Of contagious diseases, mange amongst horses, sheep, dogs, and cats, was observed to exist, also glanders and farcy in horses. Professor Schiff, of Bern, in his yearly report, mentions the frequent occurrence of an eruption about the head in cats. On a more careful examination, he found it to be mange, and he describes the insect as the sarcoptus, and compares the disease to the Norwegian mange in man. This confirms the observations made by the author in his report of 1857, and also his experience that it does not yield to the usual remedies employed in the treatment of mange, but that the ointment of creasote, when applied in time, is followed with the best results.

NEW MEMBERS OF THE PROFESSION.

At an examination of the pupils of the Royal Veterinary College, held on December 19th, by the Court of Examiners of the Royal College of Veterinary Surgeons, the following received their diplomas:

Mr. Thomas Billington . .	Preston, Lancashire.
— Joseph Clarke. . . .	Horncastle, Lincolnshire.
— Henry Chesser . . .	Wood Green, Middlesex.
— William Fox	Walthamstow, Essex.
— Alban Bull	Shotswell, Oxon.
— J. Griffiths Cattrall . .	Chester.
— George Blake	London.
— George Lewis	Monmouth.

Veterinary Jurisprudence.

COURT OF QUEEN'S BENCH.—Westminster, December 6th.

(*Sittings at Nisi Prius after Term before* Lord Chief Justice Cockburn *and a Special Jury*).

BOTTERILL *v.* BATTY.

Mr. Knowles, Q. C., and Mr. Field appeared for the plaintiff. Mr. Serjeant Pigott and Mr. Udall for the defendant.

The action was brought to recover £250, the price of a four-year-old chestnut hunter, sold by the plaintiff to the defendant on the 26th of July last. The defendant paid £50 into court, and, as to the residue, pleaded "never indebted."

The horse, which was the subject of dispute between Mr. Richard Botterill, of Garton, in the East Riding, and Mr. John Batty, of Bishop Monkton, near Ripon, was a remarkably fine animal. Mr. Botterill bought him in November, 1860, for £75. He was worked a little in a light chaise during the winter, and was thoroughly broken in during the spring. On the 15th of July, 1861, at the Royal Agricultural Society's meeting at Leeds, the horse carried off the second prize in the class for four-year-old hunters. On the 26th of the same month there was a large show at Driffield, and the horse carried off three prizes—as a four-year-old; as a hunter; and as the best horse on the ground. In the interval between the two shows a little hair had been knocked off one of the hind legs, either in the railway truck or by some slight blow from shying at the station. The material question, however, did not turn upon the injury, which was noticed both by vendor and vendee at the time of the bargain at Driffield, but upon the question whether the horse was naturally sound or not when Mr. Botterill arranged to sell him to Mr. Batty for £250, and to deliver him in a day or two. Mr. Botterill sent the horse over to Malton on the 8th of August, and in a day or two he was

taken thence to Bishop Monkton. Within a very few days Mr. Batty sold the horse for £260 to Mr. Chinnock, near Reading, and Mr. Chinnock subsequently sold him for £270 to Mr. Collins, of London. Mr. Collins, however, returned the horse, and so did Mr. Chinnock, and Mr. Batty also desired to return him for unsoundness, or to reduce the price to £50, which he had paid into court, as his full value.

The case for the plaintiff was that the horse was perfectly sound on the 26th of July, and that any defects now visible had arisen from subsequent causes, and particularly from the effects of epileptic fits and a wound on the head. It was not denied that the horse was warranted sound to Mr. Batty, and Mr. Botterill relied upon the evidence of Professor Spooner, Mr. Bowman, Mr. Holmes, and other veterinary authorities, who saw the animal at Driffield, and proved that at that time there were no indications of unsoundness. Mr. Holmes had a horse competing with the animal in question at Driffield for the prize, and if there had been any symptom of disease it would have been a disqualification. Mr. Holmes's horse took the second prize, and he said he should certainly have called attention to any defect in this horse had any been distinguishable on the day of the show, which was also the day of the sale.

The case for the defendant was that the horse was naturally unsound or affected with hereditary disease when Mr. Botterill sold him at Driffield, and *Assistant-Professor Varnell, Mr. Field, Mr. Mavor, Mr. South, Mr. Cox, Mr. Greenway, Mr. Chinnock, Mr. Brewster*, and other witnesses, declared most unequivocally their opinion that he was a "whistler," had bony enlargements inside each hind leg, and also a curb on the off hock. Great stress was likewise laid on the enlargements of the hocks, as being spavins, and Mr. Field said this disease had probably existed for some months. Mr. Varnell and others, however, denied the existence of spavins, and spoke of the enlargements as being splints. No very great point was made of the curb.

Mr. Collins, on discovering the "whistling," sent the horse at once to the Veterinary College, and he was there pronounced unsound, as a "whistler," and having bony enlargements—splints—of long standing, a short distance below the seat of spavin. Mr. Varnell admitted that the horse was not *now* a "whistler," but that the enlargement of the bones of the hind legs was unsoundness.

Mr. Mavor (in reply to his Lordship) said that understanding that this horse had never done any hard work, he was of opinion the bony enlargement of the hocks was constitutional, and would therefore take more time to develop than if the animal had been hard-worked. He examined the horse on the 28th of October, and he thought the disease must have existed for at least three months.

Mr. Richard Barker, of Malton, to whom, by defendant's directions, the horse was delivered on the 8th of August, said that in his opinion the horse was not deliverable on account of unsoundness. The hair was off the leg and the hocks looked large. Mr. Botterill bought the horse of him for £75, and promised, if he was lucky with him (Mr. Barker), to give him something more. When the horse took the prizes at Leeds and Driffield witness thought that, as a gentleman, plaintiff should have given him £5.

Mr. W. Rookes, of Exeter, and other witnesses, said that on the assumption that the horse was spavined, he was not worth more than £40.

Plaintiff's witnesses said that in their opinion the horse was worth £100 in its present condition, or £80 even if spavined, though they did not believe it. They admitted that the horse went lame to-day, when brought down to Palace Yard for the inspection of the jury, but they attributed this to the state of his feet.

The whole of the evidence on both sides being finished, the further hearing was adjourned until the next day.

SATURDAY, DECEMBER 7TH.

The jury retired to deliberate at one o'clock. About a quarter to three they sent a note to his Lordship, intimating that there was no chance of their agreeing upon a verdict. A futile effort was made to arrange matters between the parties. At a quarter-past three the Chief Justice sent for the jury, and the foreman said they were 10 to 2.

Mr. Field said he would not take upon himself the responsibility of accepting the verdict of 10.

The *Lord Chief Justice* said the same thing happened in the city not long ago. The jury were divided, 10 to 2, with no probability of agreement. One party assented and the other refused, and afterwards it was found that the party refusing to abide by the judgment of the 10 would have had the verdict.

The jury were then discharged.

The *Lord Chief Justice* said that in this case every effort should be made to arrange matters, because it was very likely it would be tried again with the same result.

It was rumoured in this case, also, that the ten were for the side refusing to take the verdict—that is, for the plaintiff.

COURT OF COMMON PLEAS—NOVEMBER 28TH.

(*Sittings at Nisi Prius at Westminster, before the* Lord Chief Justice *and a Special Jury.*)

ANDERSON *v.* NICHOLSON.

THIS was an action brought by the plaintiff, a horse-dealer, to recover the sum of £100 upon the warranty of a horse

It appeared from the evidence of the plaintiff that, having heard that the defendant, who is a widow lady, living at Cowley Hall, near Slough, had a horse for sale, he went down to see it, and after looking at the animal he asked the groom the price, and his reply was £150. The plaintiff considered it too much, and offered £100, but eventually the purchase was completed at £120, for which he gave a cheque for the amount, and took a warranty for the horse's soundness. Subsequently the plaintiff sold the horse to Lord Huntingtower, and he was afterwards returned and examined by Professor Spooner and Mr. Mayor, who found that the animal's fore feet were diseased, and that a bone-spavin existed in one hock, upon which the horse was taken to Tattersall's and sold for £20.

The defence was that the horse was never warranted. The plaintiff brought a cheque for a "black gelding, warranted sound," which words were written on the cheque, but which the defendant refused to accept, on the ground that the horse was not warranted. The plaintiff said it was only a matter of form, as they always drew their cheques in that manner.

Mr. Hawkins, Q. C., and Mr. Garth were counsel for the plaintiff; Mr. Serjeant Shee, Mr. Russell, and Mr. Willoughby for the defendant.

The jury ultimately returned a verdict for the defendant, saying that they believed there was no warranty given.

CAN A DOG LAWFULLY POACH?

A curious case of poaching has been tried at Mehun, France, the question being whether the master of a dog allowed to run wild about the country is answerable for the said dog's gaming propensities. A Mons. Castlebon went from Mormant to Ozoner-le-Rupos, where there was a fête; he had his wife with him, and also his little children, and certainly as small an idea of sporting or poaching as could be imagined. Unfortunately he had also with him his dog, an animal that had blood in its veins, whose father or mother had been of the true pointer class, and who felt himself at liberty to look after a leveret, and to pursue it into a preserve belonging to M. Duval. A summons was taken out by the gamekeeper of the latter against M. Castlebon, who, it was declared, had not called his dog off, and had thus rendered himself *particeps criminis*. The Court condemned the defendant to pay a fine of 50f. and 10f. damages, as well as the expenses. M. Castlebon appealed against this decision. He declared that the beast was not a sporting character, but a house-guardian, but that, in spite of all his efforts, the creature was determined to have a bit of game on the occasion referred to, and paid no attention to his voice, and that he had offered to pay M. Duval for whatever damage had been caused. The Court considered that M. Castlebon had not been proved to be an accomplice of his dog in the depredation complained of, and reversed the decision of the lower tribunal.

ARMY APPOINTMENTS.

War Office, Pall Mall, *Nov.* 26, 1861.

9th Lancers.—Veterinary Surgeon George Longman, from the Royal Artillery, to be Veterinary Surgeon, *vice* Frederick Bailey, permitted to retire from the service.

Royal Artillery.—Acting Veterinary Surgeon George A. Oliphant to be Veterinary Surgeon, *vice* Christopher Sanderson, deceased. Acting Veterinary Surgeon David Paley to be Veterinary Surgeon, *vice* Henry Dunsford, resigned.

Cape Mounted Riflemen.—Acting Veterinary Surgeon Frederick Fitzhugh Marshall to be Veterinary Surgeon.

To be Veterinary Surgeons of the 1st Class.

Veterinary Surgeon Francis Frederick Collins, 16th Lancers.

Veterinary Surgeon John Surtees Stockley, Royal Artillery.

Veterinary Surgeon Alfred Job Owles, 6th Dragoon Guards.

Veterinary Surgeon Stephen P. Constant, 5th Dragoon Guards.

Veterinary Surgeon Hicks Withers, 3rd Hussars.

To be Acting Veterinary Surgeons.

William Hall, gentleman.
William Barker Walters, gentleman.

MISCELLANEA.

At a meeting of the Council of the Royal College of Surgeons, held on December 19th, Mr. W. Henry Flower, F.R.C.S., Assistant-Surgeon to the Middlesex Hospital, was elected Conservator of the Hunterian Museum, vacant by the decease of the late lamented Professor John Quekett. The *Lancet,* in referring to this appointment, says that "Mr. Flower's qualifications are of a very high character, and there can be no doubt that this choice will be in all respects approved by the profession. His services to the museum of the hospital with which he is connected, and his contributions to zoological and anatomical science, are so many valuable testimonies to his good will, and excellent capacity for the office."

OBITUARY.

We have been informed of the death, at Lahore, of Robert Moorhead, Veterinary Surgeon of the late 5th European Cavalry there, now Light Dragoon Depôt. His demise took place on the 10th of October last. He obtained his diploma May 28th, 1851.

Also of the death, on December 16th, at Newcastle-on-Tyne, of George Westropp, M.R.C.V.S. His diploma bears date May 15th, 1850.

Thus death continues its dreaded work among us. While there is nothing so uncertain as life, there is also nothing so certain as death. One and another go before us, and yet the world standeth not still, all things continue as they were at the beginning. 'Tis well—

> "There is a calm for those that weep,
> A rest for weary pilgrims found."

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Communications and Cases.

DEATH OF SEVERAL HORSES FROM FEEDING ON OATS AFFECTED WITH FUNGI.

Communicated by Assistant-Professor VARNELL.

THE following interesting particulars relating to the death of several horses from partaking of some deleterious oats were recently forwarded to me by Mr. Mitchell, M.R.C.V.S., Leeds. In his first letter dated August 27th, 1861, Mr. Mitchell writes as follows—

DEAR SIR,—A gentleman in this locality, has lost six horses in a very sudden manner. The veterinary surgeons engaged, viz., Messrs. Dray, Cuthbert, and myself, are unanimous in our opinion, that poison, in some form or other, is the cause of death, notwithstanding that the contents of their stomachs and intestines have been analysed by different chemists. No trace of poison, it is said, can be found. The oats, beans, &c., have also been subjected to a like analysis, and with the same result. We feel pretty sure that the cause of death is connected with the oats, *three feeds* of which, given to a horse obtained for experiment, were found sufficient to produce death. Should you be able to afford us any assistance in investigating this case, you would confer at least a great obligation upon myself. A history of the cases, with the *post-mortem* appearances, shall be sent you forthwith.

I am, dear sir, &c.,
(Signed) JOHN MITCHELL.

In reply, I informed Mr. Mitchell of my readiness to give him every assistance in my power, and requested to be furnished with a history of the cases, and also with some of the suspected oats. To this I received the subjoined reply—

5, WOODHOUSE LANE, LEEDS;
Sept. 2, 1861.

MY DEAR SIR,—I hope to send you the particulars of the cases referred

to in my last, by to-morrow's post. I have also directed that some of the oats be sent, and they will leave here, per Great Northern Railway, to-morrow.

I am, sir, &c.,
(Signed) JOHN MITCHELL.

Two bushels of the oats duly arrived, and also a detailed account of the cases to the following effect—

July 22.—This afternoon Mr. Dray, M.R.C.V.S., of this town, was requested to attend a gray pony, at the stables of Mr. Wm. Ingham, tanner, Armley, near Leeds. On his arrival, he found the pony down and unable to rise, and evidently "in *articulo mortis;*" in fact, the animal died soon afterwards. The only symptoms observed by those who saw the pony previous to Mr. Dray, were a staggering gait, and laboured respiration. Mr. Dray from noticing a very blanched condition of the mucous membranes, concluded that death was probably caused from internal hæmorrhage, and he made no post-mortem examination.

July 24.—On the groom visiting the stable, at three o'clock this morning, he was surprised to find a valuable thorough-bred hunter (which to all appearance was in perfect health on the previous night), down, and unable to rise. Mr. Dray was immediately sent for, and attended forthwith. He observed the following symptoms:—The horse still down. Pulse, 58, and full; mucous membranes slightly injected, and breathing laborious. The muscles also of the loins and hinder extremities were partially paralyzed, and the tongue was hanging from the mouth. The groom accompanied Mr. Dray to his residence, for some medicine, but on his return to the stable, as the horse was evidently dying, the medicine was administered. He died at eight o'clock, a.m.

At two p.m., this same day, a brown mare, which the groom had ridden when going for Mr. Dray, and which was ridden by that gentleman to Armley, and remarked upon by him as being fresh and eager for going, was found down in her box. Mr. Ingham immediately started for Mr. Dray, but as he was from home, Mr. Cuthbert, and myself, were desired to attend. We arrived at three p.m., and found the mare standing; pulse 55, and full; conjunctival and Schneiderian membranes slightly injected: respiration laboured, and extremities warm. In fact, there was nothing to lead us to suppose that she was in danger. Some oleaginous-purgative medicine, which had been intended for the thorough-bred horse had already been given, and some further medicine was ordered by us. We then left her to make a post-mortem examination of the horse, the abdomen of which had already been opened, and the intestines removed. The external appearances presented were quite in accordance with perfect health; but on cutting open the stomach, the villous portion of the mucous membrane was found to be highly inflamed, and easily removeable from its attachment to the muscular coat. On opening the small intestines, the lining membrane was found still further inflamed, and in some places seemingly to be entirely gone. The liver and lungs were much congested. The stomach and intestines of the gray pony, which were in the course of being buried, were next exhumed, and presented exactly similar appearances.

Our attention was now directed to the food, and which we found to consist principally of oats, that had been in stock for some weeks, and upon which the animals had been regularly fed up to this date. Some bean-meal and bran also, both of which had been purchased on the day before the pony died, had been used for the first time on the evening previous.

The oats, which were foreign ones, consisted originally of twelve quarters

of which about five quarters now remained; and with the exception of having a fusty smell, they presented nothing remarkable, nor did the bean-meal or bran, both of which had been purchased from a respectable dealer, and were unexceptionable in quality. It was deemed imperative, however, that no more of either should be used until an analysis had been made by a competent chemist.

I will now return to the case of the brown mare. She was seen by Mr. Dray and myself at 8 p.m., and appeared in much the same condition as at 3 p.m. We exhibited some medicine, and left more to be given every four hours. An injection was also thrown up, and orders given to repeat it, if necessary, during the night. The mare *was seen to drop* at 2 on the following morning, and died at 11; and when examined *post-mortem*, the condition of the stomach and small intestines was found to be precisely similar to the others.

A gray draught-gelding, out at grass, was at 6 on the morning of the 31st found down in the field and unable to rise. This horse had some of the oats on the 24th, and was noticed on the 25th not to be so well as usual. He however appeared to recover shortly afterwards, and no further notice was taken of him until he was found down.

I saw him at noon, and as he was then evidently past recovery, no medicine was given. At Mr. Ingham's request he was destroyed. *Post-mortem* similar to the others.

An aged black draught mare, emaciated but still in good health, was this afternoon obtained for the purpose of experiment, and placed in the same box which the other animals had died in. She had a feed of the oats on her arrival, and was regularly fed till the evening of the 2nd of August. On the 3rd of August, at 6 a.m., she was found down and unable to rise. She had eaten her evening feed, and died at 11 a.m. *Post-mortem* as the others.

Another mare was now purchased and placed in the same box, but fed upon food obtained from a different source. She remained a week, and as she was then in good health she was removed.

On the afternoon of Saturday, the 17th of August, a dun pony fourteen hands one inch high, was placed in a stable several hundred yards from Mr. Ingham's, and fed upon the suspected oats. He had one feed in the evening, one on Sunday morning, and a third in the evening of that day, with the addition of a small handful of hay. He was found *dead* at 7 o'clock on the Monday morning, having eaten only part of his food. The corn remaining in the manger was completely saturated with saliva, the quantity of which Mr. Ingham estimated at between three and four pints. The *post-mortem* like the other.

The stomach and intestines, with their contents, and also a portion of the liver of the bay horse, brown mare, and gray horse, were given over for analysis to two different chemists, but nothing has been found to assist in a solution of the mystery. The oats, bean-meal, and bran, have also been analyzed, but without any poisonous matter being found.

Some of the oats have been sent, per Great Northern Railway, directed to you to-day, and I hope you will give them to an animal; if so, I have no doubt they will produce death. I think the matter should be laid before the profession, and I shall be glad if you will take steps to have the cases published. Should you wish for further information, I will endeavour to obtain it.

I am, my dear Sir,

Yours very truly,

(Signed) JOHN MITCHELL.

To George Varnell, Esq.,
Royal Vet. College.

On the 10th September, 1861, a brown mare was procured by the College for the purpose of being fed upon the suspected oats. She was old, but apparently in a healthy condition. She was placed in a loose box, and on the first day had only one feed of the oats given her. On the 11th, she had four feeds, and the same quantity on the 12th. On the 13th, however, she had only three feeds, for during the afternoon of this day, she was observed to have a staggering gait, and at six in the evening, she fell, and was unable to get up again Her hind extremities were nearly paralysed. Sensation was so benumbed, that she scarcely responded to the prick of a pin. The visible mucous membranes were pale, the pupils dilated, breathing increased, apparently chiefly from the position in which she laid. The pulse numbered about fifty, and was very feeble, and her tongue protruded from her mouth. She did not appear to suffer much pain. She lingered on until the 15th, when she died, and immediately after death, an examination of the body was made.

The stomach and intestines were found to be pale in colour and very flaccid. The liver was small, and also paler than natural; spleen very small; the mucous membrane of the stomach and intestines likewise, much lighter in colour than natural. On the surface of the lungs there were marks of long standing disease, but these could not have had anything to do in causing the death of the mare, and which I had no doubt whatever was caused by her eating the oats with which she had been supplied.

In reflecting on the above facts, it is difficult to come to any other conclusion, than, that the death of all the horses, including the mare experimented upon at the College, was caused by eating the oats in question, although we may not be in a position to state, with any degree of precision, the nature of the poison they contained, or even whether it were mineral or vegetable. The oats, it is true, had been analysed by three competent chemists, two of them residing in Leeds, and a third in London, viz., Professor Tuson, Lecturer on Chemistry at the Royal Veterinary College. None of these gentlemen detected any mineral poison, and as the symptoms evidenced by the animals, as also the post-mortem appearances were such, as not to lead to the idea that agents of this class had been partaken of, I think a very strong inference may be drawn, that the death of the horses was not so caused.

The next question which naturally suggests itself, is, what could there be in the oats themselves, or diffused among them, to have been so injurious to animal life? Again, it may be observed, that none of the chemists mentions his having

detected any *vegetable* poison, such as we can conceive would have been *mixed* with the oats to an extent sufficient to have caused the death of animals. And as we have no positive evidence that such a wicked proceedure had been resorted to by any one, we must, I think, on the score of charity, conclude that no one had been base enough to attempt such an act. If then we are to discard the idea that the animals were not destroyed by either of the above means, *that is,* by no poison—mineral or vegetable—the question arises :—What is the most probable cause of death ? Is there anything peculiar belonging to the oats, independent of what could have been added to them, which would be likely to affect the health of animals fed upon them ? This is a question which I think should be left open ; and that we ought simply to record what we have noticed, leaving for future observation and investigation to either negative or confirm our surmises.

It may be asked in the *first* place whether anything has been found in the oats to raise a suspicion that they are not healthy food, and *secondly,* if so, do the symptoms wholly or in part, agree with those we should expect would be developed in horses which had been fed upon them ? On the arrival of the oats at the College, I at once, as a matter of course, looked at them, and my first impression was, that they were a very bad sample of feeding corn. They were damp, dark in colour, and had a very musty smell.

I was now led to investigate them more closely, and I found that many were matted together into lumps by a thready, cobweb-like kind of material. The majority of them were covered with a smutty substance, and the interior of a considerable number was decayed, so that, instead of the natural white flower of the oat, this was filled with granular matter having a blackish-gray hue, and which in many instances projected some distance above the surface of the oat. This slight investigation induced me to carry the examination still further, and for this purpose I sought the aid of the microscope, by which I was enabled to discover, that the thready material consisted of elongated cells ; that the surface of the oats was covered more or less, with well-defined bodies, which were also observed, but in fewer numbers, to be connected with the thready material, and that the dark-gray matter found in their interior was granular, the granules being supported by a reticular-like substance.

During this brief examination, an idea arose in my mind that I was looking at some parasitic fungi, and which were, perhaps, poisonous, and I thought it even probable that the death of the horses might have been caused by these para-

sitic bodies. This determined me to have recourse to the experiment of feeding a horse upon them, and for this purpose, as previously stated, an old but healthy mare was purchased. The result I have before described, and which we see so closely agrees with the experiments carried out at Leeds, that I did not deem it necessary to procure another subject for the purpose. To still further carry out, however, the investigation, portions of the oats were handed to Professor Tuson for his examination, the result of which he has kindly placed in my hands, illustrated with several beautiful engravings by his brother, Mr. H. B. Tuson, and to which I would now especially refer the reader.

PROFESSOR TUSON'S REPORT ON THE CHEMICAL AND MICROSCOPICAL EXAMINATION OF SOME OATS SUPPOSED TO POSSESS POISONOUS QUALITIES.

The following report embodies the results of the chemical and microscopical examination of some oats that were supposed to have caused the death of several horses that had partaken of them as food.

My first object was to prove the presence or absence of mineral poisons, but chemical analysis failed to detect any deleterious matter whatever.

The structure and general physical characters of the oats were then carefully studied and compared with those possessed by oats of good quality.

General characters of the Oats.

The oats had what is commonly known as a musty odour. When examined by the naked eye, they were found to be coated more or less completely by a grayish pulverulent matter which could be easily detached, and by minute specs having a drab colour, and sometimes a silvery white appearance.

By referring to B, Fig. I, one can observe the appearance presented by many of the oats. On the left side of this drawing is represented the grayish deposit in great quantity.

It there appears to be convoluted or folded. On making longitudinal sections of some of these oats, the white farinaceous matter contained in oats of good quality was sometimes partially and sometimes completely replaced by a dark-coloured, hard, horny mass. C, Fig. I, represents a vertical section of an oat of this description, in which the horn-like body has been partially developed. A, Fig. I, is a section of a healthy oat, and is placed by the side of C for the sake of comparison.

Fig. I.

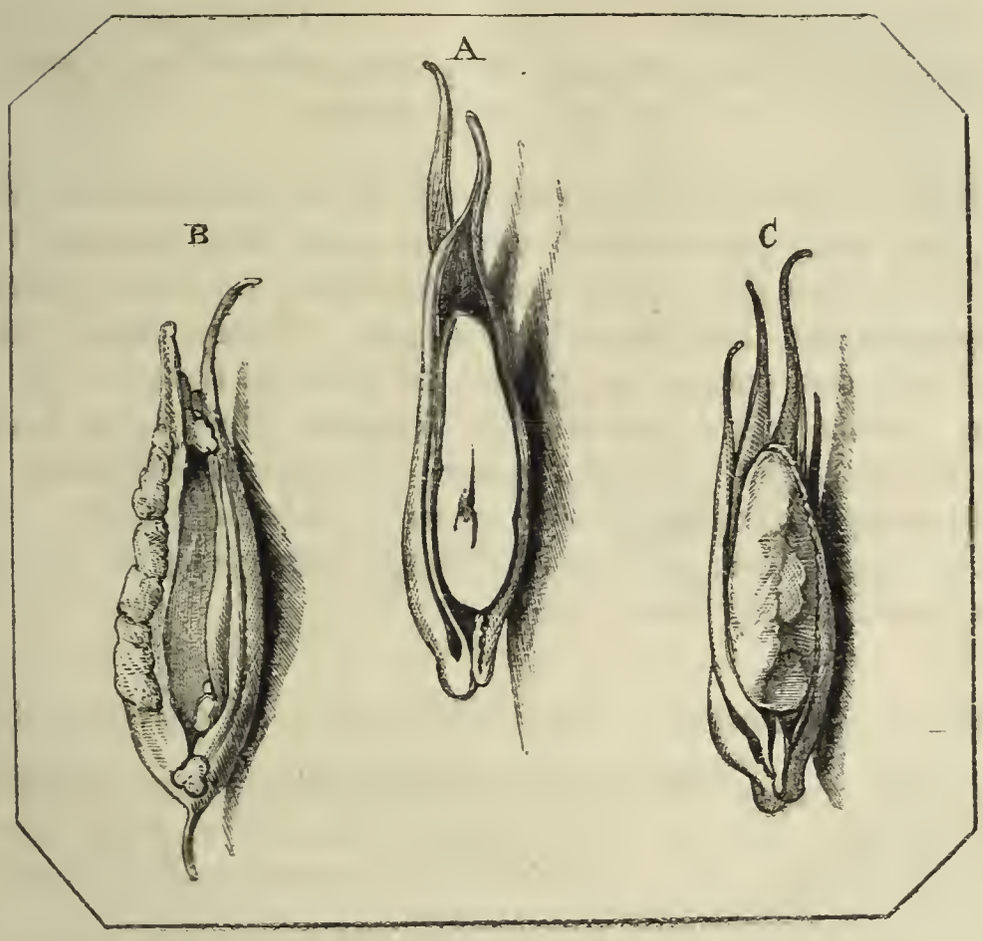


Fig. II.

Microscopic examination of the gray pulverulent deposit and of the horny mass.

When microscopically examined by a quarter-inch object-glass, the gray pulverulent deposit upon the exterior of the oats, as well as the horny mass contained in them, presented the appearance indicated in Fig. II. These small circular bodies are the spores or germs of minute fungi. By instituting a more rigid search, the objects shown in Fig. III were discovered. They appear to consist of long tubes terminating in a congeries of minute globular bodies. These are the mycelium or roots of fungi belonging to the *mucor* or common mould class.

Microscopic examination of the surface of an entire Oat.

For this purpose it was found desirable to employ reflected light, and to use an object-glass, having a half inch focal power. A, Fig. IV, represents the surface of an oat upon which is standing and apparently out of which is growing a fully developed fungus of the most beautiful description. The head of this little fungus evidently resembles that of the common mushroom in its general appearance. It belongs to a species of *aspersgillus*. In the other parts of the same drawing we may easily detect some of the spores depicted in Fig. II, the mycelium or roots shown in Fig. III, and a number of the mushroom-like fungi (*aspersgill*) referred to in the preceding paragraph.

Results of experiments made with the Oats.

A quantity of the oats under examination, and an equal quantity of oats of good quality were placed side by side, moistened occasionally, and kept at a temperature of 80° Fahr. After three or four days, both kinds began to germinate. As the germination proceeded, an immense quantity of fibrous vegetable matter formed upon the bad oats, causing them to mat firmly together so that one could lift them up *en masse*, and it required the application of a considerable amount of force to tear them asunder. The good oats, although they had been exposed to the same influences as the bad ones, and although they had undergone germination, were entirely free from the fibrous vegetable development just alluded to.

In another experiment, some of the oats were mixed with

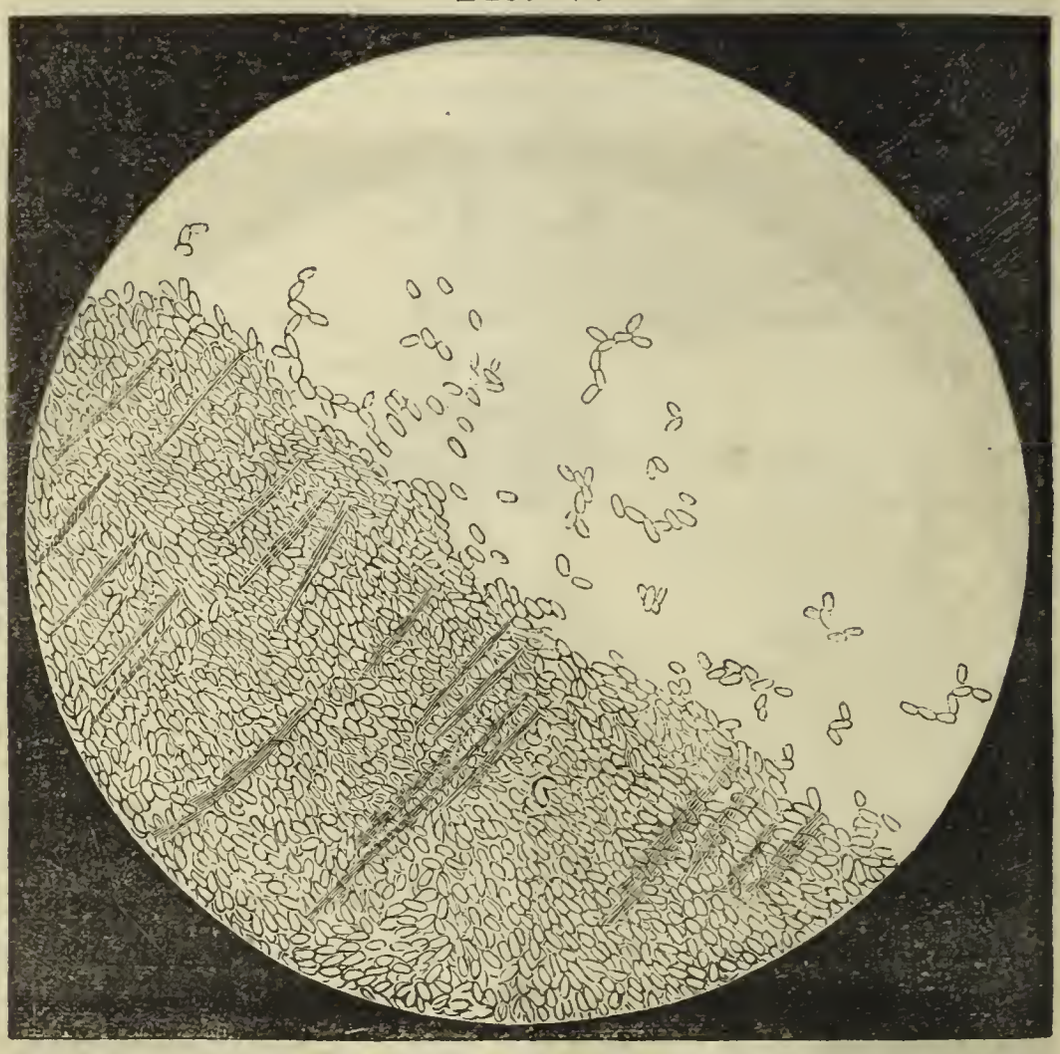
Fig. III.

Fig. IV.

distilled water, well shaken, and strained through calico. The strained liquid was afterwards passed through paper. By this means we obtained a brownish mud-like substance which remained upon the filter, and a clear transparent fluid which passed through the filter. On allowing the precipitate to remain in the laboratory at a temperature between 60° and 70° Fahr., it soon assumed a mould-like appearance superficially. This mould-like substance when magnified, exhibited a vegetable filamentous structure, the filaments interlacing one another in a most beautiful manner, and similar to, if not identical with the substance produced during the germination of the bad oats, and which caused them to mat together.

The clear liquid which passed through the filtering paper, after standing for a few days, developed a large quantity of a grayish insoluble substance, a portion of which fell to the bottom of the vessel, and another portion floated upon the surface of the fluid, and exhibited to the naked eye very marked "mouldy" or fungoid characters. Fig. V shows

Fig. V.



the microscopic appearance of the fungoid matter produced upon the surface of the fluid. Its structure, as well as its

mode of formation, is very similar to that of the common yeast plant (*torula*). The foregoing observations clearly prove the existence of a fungus in and upon the oats of bad quality.

The question now arises, may this fungoid matter have occasioned the death of the animals that partook of these infected oats? However, before attempting to answer this question, I may be permitted to direct attention to the following remarks.

Many fungi are well known to be poisonous. For example, in the ergot of rye, we have a microscopic fungus, apparently generated under circumstances similar to those under which the fungus upon the oats was developed, and often acting, when introduced into the system, as a powerful poison. I may here mention, that I believe the symptoms observed in the horses that died subsequent to their eating some of the oats forming the subject of this communication, are comparable with those exhibited by animals suffering from the effects of an over-dose of ergot. Again, the following illustrations may be taken of the poisonous effects of microscopic fungi. The Rev. M. J. Berkeley, in his 'Outlines of British Fungology,' while referring to the physiological action of ergot on animals, says, "It is observable that the same bad effects are sometimes produced by mouldy (fungous-containing) provisions which are produced by ergot in bread." In a lecture on the "Parasitic Fungi of the British Farm," delivered by the Rev. Edwin Sidney at the annual meeting of the Royal Agricultural Society, held at Norwich, July 18th, 1849, a fungus is described called *ustilago hypodytes*. It is a species of penicillium, "it attacks grasses or hay, and appears to be quite poisonous. . . . The structure, in a very young stage, is thread-like; but all traces of mycelium (spawn) soon disappear, and nothing remains but a mass of minute spores. . . . In addition to the ruin of the grass, this fungus is most pernicious. According to Leveillé, the immense quantity of black dust resulting from it in the hayfields of France, produces disastrous consequences on the haymakers, such as violent pains and swelling in the head and face, with a great irritation over the entire system." Further on, in the same lecture, Mr. Sidney, in reference to the *ustilago hypodytes*, says, "I will only remark that it is more common than is supposed, and I am persuaded that cattle in ill-drained localities, where it always abounds, derive serious injury from it, and that it is the unsuspected cause of many disorders both in them and in human beings." Mr. Sidney likewise states that *penicillium*, the mould on hay, "is

found on bread, also in the inside of casks; and there is reason to believe its spores poisonous, for two coopers who entered a great tun, covered with this mould, to clean it, inhaled them, and were seized with violent pains in the head, giddiness, and vomiting, which only yielded to severe medical treatment."

Considerations suggested by the foregoing facts and observations.

1st. No mineral poison was discovered in the oats by chemical analysis.

2nd. The oats were extensively contaminated by a mould-like fungus.

3rd. It is known, on good authority, that many mould-like fungi are poisonous to animals.

4th. The infected oats were given by Professor Varnell and others to several horses, and the animals subsequently died.

Now, without stating positively that the infected oats poisoned the animals that eat them, I think we may safely infer from the facts referred to in this report alone, that in all probability they were the cause of their death.

Since writing the above I have had an opportunity of showing the drawings of the fungi to Mr. Jabez Hogg, whose intimate acquaintance with microscopic subjects is well known. Mr. Hogg at once identified the fungi, portrayed in Fig. IV as a variety of *aspersgillus*.

It will also be interesting and satisfactory to state, that this gentleman had no hesitation in saying that the horses were killed by the fungus attacking the oats; for he knew of many instances in which sickness and death had been occasioned in various animals by the very same species.

With this report before us we may now inquire how far the symptoms, observed in these cases, agree with those of poisoning by vegetable fungi, as noticed in the human subject; for we have no veterinary data which can assist us in coming to a right conclusion on such a point. On referring to Taylor, 'On Poisons,' p. 768, I find that the following symptoms—produced in the human subject from partaking of poisonous fungi—are the most prominent; viz., giddiness, dimness of sight, debility, stupor, and injection of the visible mucous membrane, the stupor being in many instances followed by irritation of the intestinal canal and with vomiting and purging.

Other authors mention the presence of such symptoms as fainting, loss of motor power, small, feeble pulse, cold sweats, dilated pupils, loss of sight, and death.

It will be seen, on referring to the description of the symptoms, as given by Mr. Mitchel, that the gray pony, when first taken ill, was found to have a staggering gait, and that when down he was unable to rise, also, that his breathing was laboured, and the visible mucous membrane blanched.

The next case—a thorough-bred hunter—was found down, and quite unable to rise, in consequence of his hind extremities being partially paralysed. His pulse numbered 58 per minute; his tongue hung partially out of his mouth, and the mucous membranes were slightly injected.

In the third case—a brown mare—the pulse was 55, and mucous membrane also injected; but no other symptoms are described.

The fourth case—a gray cart-horse—was found down, and unable to rise.

Then comes an experimental case. A black cart-mare had some of the oats given her, and on the day following she was found down, and unable to rise.

The next was also an experimental case. A pony, which likewise died on the second day, after having partaken of the oats. Some of his symptoms are recorded; and the manger from which he had eaten his food was found to contain from three to four pints of saliva.

With regard to the brown mare which was fed with some of the oats at the College, it will be seen that, after partaking of them for three days, she also was found to have a staggering gait, feeble pulse, pale mucous membranes, and dilated pupils. Besides these symptoms, her tongue partially protruded from her mouth which was accompanied with a dribbling of saliva; and when down she also could not get up again, in consequence of her hind extremities being paralysed.

It will thus be observed that in all the cases, loss of power, especially of the hind extremities, was present, except in one, and in this case the symptoms are not recorded. In all, also, the symptoms, judging by analogy, are characteristic of poisoning by narcotic irritant poisons.

With regard to the post-mortem appearances, they are not so conclusive. In some instances the irritating action of the agent which had caused the death had shown its influence by an increased redness of the mucous membrane of the stomach and intestines; while, in other cases, this condition of the membrane was not observed. In the brown mare, for ex-

ample, which died at the College, the whole of this mucous track was pale and flabby.

From the foregoing statement, the evidence is strongly in favour of death having been caused by poisonous fungi, in, upon, and among the oats which the animals had partaken of, but still we are not in a position to assert positively that such was the case. We have seen that no injurious effects were observed until nearly half the quantity bought by Mr. Ingham was consumed, and we may not unreasonably suppose that the twelve quarters were not the whole of the oats of that peculiar quality which the cornfactor had originally purchased, but that others, from the same lot, were sold by him to different horse proprietors, and, for ought we know, their horses received no injury by eating them.

This being the case, we can only suppose that the oats, which were originally of inferior quality, were placed in a narrow and deep bin, and that while there they underwent a change favorable to the development of poisonous fungi, which we have clearly shown existed to a very great extent. This change probably took place in the centre of the bulk, as can be readily imagined, and as such it will account for the horses not being affected until that portion was arrived at. If this be not the true explanation, then the only other way we can account for the deleterious character of the oats, would be by supposing that some poisonous agents had been mixed with them at this stage of their consumption, and which has altogether escaped the search of the chemist.

The above cases are highly interesting in several points of view. They will doubtless excite in the minds of many practitioners, when searching for the cause of disease, or even death, that other objects must be investigated beyond those they have been in the habit of looking for.

POISONING BY ARSENIC.

By R. Mackinder, M.R.C.V.S., Peterborough.

I send you a few particulars relating to the cases of poisoning which occurred to some animals the property of H. Bird, Esq., Gazley Hall, near Peterborough, should you deem them worthy a place in the pages of the *Veterinarian*.

Case 1.—On the 28th of August last, I was requested to visit a fine chesnut hunter, degraded to work on the farm

in consequence of being a roarer, who was described as being seriously ill. I arrived about ten o'clock, a.m., and found some labourers in the yard with the horse, who told me he had been ill all night, and that he had just fallen down head foremost, and had been with great difficulty got up again by their assistance. Profuse sweat bedewed his whole body, besides which he had evidently lost the power of vision. He was likewise suffering acute abdominal pain. I attempted to give him a diffusible stimulant, but on the head being raised for this purpose the poor animal again fell, seemingly from want of a due supply of blood to the brain. I then left, telling the foreman that it was too late for medical assistance to be of any use. He died about two o'clock.

Case 2.—On September 2nd, I again received a message to go to the same farm to see a valuable young cart-mare, and on my arrival I found her suffering precisely in the same way as the horse, with the addition, however, that her throat was very much swollen. The enlargement produced so much mechanical difficulty to respiration that I performed the operation of tracheotomy. I also applied fomentations to her throat, and attempted to give some medicine, but found this to be impractical. She died in about half an hour. I lost no time in making a post-mortem examination, and found that the mucous coat of the stomach was very much inflamed, all other parts of the body being quite healthy. I told the man that in my opinion the animal had died from poison.

We made a diligent search all over the premises, but were unable to find anything of a poisonous nature. There were no shrubs or anything of the kind growing near at hand which we could suspect.

Before leaving, the foreman wished me to see his cow as she appeared dull and showed symptoms of pain. I found that her rumen was fuller than usual, and that rumination was suspended, and also the secretion of milk, at least partially so. From inquiry I ascertained that on the previous day all the animals had been feeding on some mown clover, which was turned almost brown in the leaf, and that the cow had been allowed to eat all she desired. The animals had likewise all drunk at the same trough. I sent some medicine for the cow and was informed a few days afterwards that she was doing well, but afterwards I am sorry to say, that I learnt that she also died. Not being made acquainted with her death at the time, no post-mortem examination was instituted.

Case 3.—On the 21st of September, I was again summoned in haste to see a valuable chesnut cart-mare, five years old, which had been purchased to take the place of the one that had died, but before my arrival she also was dead. I called at Gazley Hall, but found that Mr. Bird was in London, I was requested, however, by Mr. Bird, senr., to spare for no reasonable expense to find out, if possible, the cause of death.

On the following day Mr. Metherell of Spalding and myself made a post-mortem examination and found all the organs healthy with the exception of the stomach, the mucous membrane of which presented such appearances as to justify our opinion of this animal also having been poisoned. The stomach &c., as you are aware have been forwarded to Professor Tuson for analysis.

I may here add that the other horses on the farm were fed on the clover and that they likewise drank at the same trough as those which died. None of them, however, have as yet been out of health.

It appears that there is a long iron pipe which conveys the water under ground from one yard to the other, and this I was told had been repaired comparatively recently with white lead, tow, and tar-cord. At the time of the occurrence of these cases it is very likely the water would remain for some days in this pipe, owing to the cattle and horses lying out in the fields at night, but I cannot attribute any mischief to this, the symptoms and post-mortem appearances being so completely unlike lead poisoning. Nor can it be possible that the water lying in the pipe could imbibe sufficient arsenic even supposing that the lead contained this substance.

You will be surprised that an analysis was not resorted to in the second case, but my employer thought with me that even if the animal was poisoned such was accidental. Indeed we thought it not unlikely that the carter had given some medicinal agent to improve the animal's coat, and thus unwittingly destroyed life. It is much to be regretted that men having the charge of horses should so often have recourse to such means to add to the animal's good appearance.

Since the death of the chesnut mare I have been informed by the foreman that two other sudden deaths occurred at an adjoining farm, also belonging to Mr. Bird, and at about the same time. One was a horse and the other a fat beast. It appears that the animals were left well at night, and both

were found dead in the morning. For the last few days of his life the horse had been fed upon the before-mentioned clover.

REPORT ON THE ANALYSIS BY PROFESSOR TUSON.

On the 23rd of September, 1861, I received from Mr. Mackinder, veterinary surgeon of Peterboro', the stomach and its contents, of a horse, which was supposed to have been poisoned.

Having, by preliminary experiments, discovered arsenic in the contents of the stomach, I then adopted special analytical methods for confirming the presence of that poisonous agent.

By the request of Professor Simonds, I append a description of the special process adopted in this investigation.

About four ounces of the contents of the stomach were covered with moderately strong hydrochloric acid. This mixture was boiled for about half an hour in an apparatus so arranged as to effect the condensation and return of the volatile matters evolved during ebullition. At the completion of this process of cohobation the acid magma was diluted with distilled water and filtered.

Examination of the filtered fluid by Reinsch's test.—The filtered fluid containing free hydrochloric acid was boiled for half an hour with a strip of perfectly bright copper. At the end of this time, the copper (which had become coated with a dark-gray deposit) was removed from the liquid, thorougly dried, placed in a dry test-tube, and heated with suitable precautions.

On examining the cool parts of the tube in which the coated copper had been heated, a white deposit was observed, which, when magnified, was found to consist of highly characteristic octahedral crystals of arsenious acid—white arsenic.

Examination of the crystalline deposit by Marsh's test.—On adding some of the crystalline deposit believed to be arsenious acid to a mixture of zinc and dilute sulphuric acid, developing hydrogen, and subsequently lighting the gas as it issued from a jet, it (the gas) burned with a peach-coloured flame.

By depressing pieces of cold porcelain upon this flame, dark, semi-metallic looking stains were obtained upon them, which rapidly disappeared when heated in contact with the air, or when they were moistened by a solution of chloride of lime.

Thus the presence of Arsenic was shown by Reinsch's test and satisfactorily corroborated by Marsh's test.

I am informed by my colleagues Messrs. Simonds and Varnell, that neither the symptoms or the progress of the disease, as described by Mr. Mackinder, agree with poisoning by arsenic; with this, as a chemist, I have little to do, but of its presence in the matter sent to me, there can be no doubt.

CHRONIC DISEASE OF LIVER ASSOCIATED WITH ESCAPE OF BLOOD FROM THE INTINES.—DEATH.

By C. Hirst, M.R.C.V.S., Barnet.

On the morning of November 25th, I was sent for to see a roan mare, the property of Mr. T. Bangs of South Mims, Barnet, which was described as being dangerously ill. On arrival, I found that the animal presented a dejected appearance, and that hæmorrhage was taking place from the bowels. The pulse was slow and weak, and the lips slightly swollen.

She had been out in the meadows with her foal, which was only weaned about a month ago; and as she had been put to work the day before I thought she might probably have over-exerted herself, being a free mare. I therefore ordered her to be kept quiet, and to be well supplied with good oatmeal gruel. I also administered a diffusible stimulant with a tonic.

26th. She has taken freely of her gruel, and appears considerably relieved; the pulse continues much the same. The fæces are more natural and not stained with blood as yesterday. The lips, however, are more swollen, but the legs and ears are natural and of their ordinary temperature. Continue treatment.

27th. A great change has taken place for the worse. The pulse is quickened, but remarkably feeble; lips much swollen, and the visible mucous membranes exceedingly blanched, almost white. The animal presses her head against the manger and reels to and fro like a drunken man. I also found that elevating her head even to the least extent produced a tendency to immediate syncope.

I told the owner that the mare could not possibly last long, and that I believed she was dying from internal hæmorrhage. She died in about an hour after my arrival. I at once made a post-mortem examination and found the intestines very pale. The lungs also were nearly as pale as if

the animal had been stuck. The heart was healthy, but the liver was dark in colour and very easily broken down. On cutting through the large blood-vessels, but very little blood escaped, indeed there appeared to be hardly as many ounces as there should be quarts. My opinion was that hæmorrhage had been taking place from the liver for some time without it being seen.

The mare was about twelve years old, and was six months gone in foal. The fœtus was fully developed, *i. e.* according to its age.

REMARKS BY ASSISTANT-PROFESSOR VARNELL.

The above case appears to me to be highly interesting, and I am not aware of an analogous one being recorded. I can, however, easily conceive that such cases are by no means rare; but in consequence of post-mortem examinations being very often carelessly performed, or perhaps not made at all, they have been overlooked.

Those of us who are familiar with the habits of the men who have the charge of our common working horses, especially such as are used for agricultural purposes, have had frequent opportunities of observing that as long as the poor animals do not wholly refuse their food, and can, by the aid of a little extra whipping, be made to perform their work, no thoughts of their being out of health ever comes into their minds. I am induced to make this remark, because I think it very probable that the mare in question had been unwell for some time, and perhaps even from the period when her foal was weaned. We can easily understand that the liver may have become surcharged with blood from a retrocession of that fluid from the exterior of the body, and also from the mammary gland, which had hitherto been largely supplied with blood for the secretion of milk. Such retrocession would lead to accumulation of the blood in the large vascular glands internally placed, and thus congestion of the liver would follow, which, however, would most likely be passive in its nature. The spleen, also, although not alluded to, I should think was somewhat enlarged.

The liver is described by Mr. Hirst as being dark in colour, soft in structure, and easily broken down with the finger. We are not informed, however, if, when a section was made through its structure, bile was observed to flow from the cut ends of the hepatic ducts, producing a number of yellowish spots on the cut surface. I can imagine that such was not the case, but, on the contrary, that a brownish-

red fluid (spoiled blood), which had found its way into the ducts by a kind of infiltration, oozed from them; or that, in this case, the blood, more or less altered in quality, had escaped in larger quantities from the capillaries, by a giving way of their coats, and had then found its way into the biliary ducts.

Should our theory be a right one, it can readily be understood how hæmorrhage could go on in the interior of the liver and the blood find its way into the intestinal canal, and in sufficient quantities to cause death.

Mr. Hirst formed a correct diagnosis in as far as there being internal and irremediable hæmorrhage, and his prognosis could not therefore err. The liver being originally affected with passive congestion only, as I suppose, would not be accompanied with any marked symptoms of ill health, and such symptoms as did exist were consequently overlooked. On the mare, however, being made to undergo exertion, as was the case just before she was taken seriously ill, the structural change alluded to would quickly result, and lead to positive indications of disease, the principal one being an escape of blood into the intestines from the biliary duct.

DISEASED COATS OF THE STOMACH OF A COLT.

By D. B. Howell, M.R.C.V.S., Reading.

Having to-day, January 6th, met with a remarkable case of thickening of the coats of the stomach, I have forwarded the same for your inspection, considering such a disease to be of rare occurrence.

The subject from which the specimen was taken, was a two-year old cart-colt, the property of H. Bird, Esq., Battle Farm.

For the first twelve months of his life he progressed as favorably as young horses usually do; but shortly after he became a "yearling," he had an attack of disease which was supposed to be spasmodic colic. As I did not attend the case, I cannot state what symptoms existed, or what treatment was prescribed. From this time, however, he gradually lost condition, and at last ate scarcely any food.

A few weeks ago, when attending some sick animals for

Mr. Bird, I was requested to look at this colt, as it was thought he had worms.

On examination, I could not detect any special disease, but I observed his gums were flabby and swollen. I slightly scarified these, and ordered some nitrated water to be given, and for him to be well nursed and have soft food.

For the last few days of his life he was fed on scalded barley, and bran with hay. Some "cattle food" also, which was warranted by the vendor to be eaten with avidity, and to fatten all kinds of farm stock, was mixed with his provendor, but when this was done he abstained from food altogether.

Yesterday afternoon I was hastily summoned to attend him, as he was very ill. On arrival, I found him suffering apparently from enteritis, and I adopted the same treatment as I usually do in such cases, and promised to visit him again in the evening. About 9 p.m., I saw him again, and found him in a violent perspiration, and in great pain. To allay this I administered a sedative draught, and also applied a sinapism to the abdomen. A short time only elapsed, and during which he suffered excruciating agony, before he began to sit on his haunches like a dog; on seeing this, I considered the case entirely hopeless. I again left him, and on going early this morning, I found he had died during the night, and from the disturbed state of the straw he appeared to have struggled very much.

Autopsia cadaveris.—On cutting through the abdominal muscles, a hard mass presented itself, which, at first I considered to be a tumour, and probably of a cancerous nature. On further inspection, however, I found it to be the stomach with its coats enormously thickened. In places it was more than three inches in thickness, and when removed (without its contents just as I have sent it) weighed no less than thirty pounds.

The intestines were of a deep red colour, due to the inflammatory action; the liver was healthy; the heart much enlarged, and the lungs gorged with blood.

I should be obliged by your opinion of the case.

[The tumour, so to call it, was ovoid in form, and about fifteen inches in its long, by eight in its short diameter. It was also about four inches in thickness.

It consisted in chief of a large mass of fibrinous material, which had been deposited on the external surface of the stomach and duodenum. A small portion only of the stomach—the pyloric extremity—and of the duodenum were

attached to the tumour as it reached us, and these showed that the coats of these organs were thickened to about double their normal substance.

On slitting up the duodenum the mucous membrane was found to be extensively diseased, and a large ulcerous opening to exist, which communicated with the interior of the fibrinous mass. A large portion of the effused fibrine had become organised, but other portions had degenerated into pus, which was dark in colour and exceedingly fœtid. The cysts which contained the purulent matter appeared to freely communicate with each other, and from one of these the pus had escaped, through the opening we have spoken of, into the duodenum.

We must date the commencement of this disease back to the time of the supposed attack of spasmodic colic, than which in its nature nothing could be more different. Considering the character of the affection and the importance of the organs involved, it is remarkable that the animal bore up so long, and that the symptoms were so ambiguous as to lead to the idea he was suffering chiefly from worms.

An accurate history of this case would have been exceedingly instructive, and we much regret that Mr. Howell has been unable to supply this.]

"GRASS-STAGGERS" SUPPOSED TO HAVE BEEN "LEAD-POISONING."

By A. J. McIntosh, Veterinary Student, Edinburgh.

Gentlemen,—It is with the greatest reluctance that I again trouble the readers of the *Veterinarian* with a subject which I am sure possesses but little general interest; but I feel myself called upon to say a few words in self-defence, in reply to Mr. Storrer's article, which appeared in a late number of your journal. Mr. Storrer states that he has a serious charge to bring against me, *viz.*, that I do not truthfully quote his words with reference to a phrase in your September number, "literature of twelve or fourteen years' standing." I cannot see any foundation for such a charge. The statement I made being, that Mr. Storrer insinuated that he had had twelve or fourteen years' experience in veterinary literature, and I cannot yet look upon his words in any other light. It must have been very evident to Mr. Storrer that *I* could not have had twelve or fourteen years'

experience, when I subscribed myself a "student" in the *Veterinarian* for August. And I cannot see the use of the definite expression, "twelve or fourteen years' standing," unless it is, as I before stated, an insinuation that he (Mr. Storrer) has been acquainted with veterinary literature for this number of years, which opinion is confirmed by the fact that he received his "diploma in 1848," and he must accordingly have been acquainted with veterinary literature for the time in question.

Mr. Storrer also states in his article, that "I surely must have had an opinion from Mr. Paterson, Mr. Strangeways, or some other that might have come in my way." A very strong proof this is, that the cases I described were not cases of grass-staggers. I certainly have had opinions from Mr. Paterson and Mr. Strangeways (from the former while with him as a pupil, from the latter while attending his lectures at the College), opinions which I cannot too much appreciate, and which I hope I shall never forget. At the same time I must inform Mr. Storrer, that the symptoms and appearances which I detailed in the August number of the *Veterinarian*, were not got up from a host of opinions, as he would have it to appear, but were the symptoms and appearances present in the cases I described, and which I had the opportunity of observing. I am quite satisfied they were not caused by "refuse paint, sheet lead," nor any other kind of lead, nor were they the symptoms consequent on lead poisoning.

Mr. Storrer also states that the cases referred to by Mr. Strangeways are very different from those I described. I think he cannot have been very particular in comparing the symptoms of grass-staggers described by Mr. Strangeways with those I detailed, or he could not have failed to observe the resemblance in almost every feature. He surely does not expect to find the symptoms in every case identically the same; they may be more or less aggravated according to circumstances. He also states that the symptoms described by Mr. Strangeways differ from those detailed by me, in being about a month later in making their appearance. The cases that I described occurred in May, when he says the grasses are very digestible, and being in the "half shot" state, ruminants thrive best upon them. Allow me to inform Mr. Storrer that this is just the time when the brain is most likely to become affected, as a result of indigestion, which the "half shot" perennial rye-grass is liable to produce, and more especially so if the weather is very dry, and the animals exposed to a strong sun.

There is, however, no occasion for me to say more on the

subject than I have done in a former paper. Mr. Storrer has not yet proved in any way that the symptoms I detailed were not those of grass-staggers; and until he does, I can take no notice of any future statement he may make. If he will write on the subject, let him be definite, and describe the symptoms and post-mortem appearances of lead-poisoning and grass-staggers, and prove to the readers of the *Veterinarian* the statement he made in a late number, namely, that the symptoms I detailed were "ridiculously" called by me those of grass-staggers.

ADDITIONAL OBSERVATIONS ON COW-SPAYING.

By Andrew Calley, Kirkton-by-Burntisland.

Gentlemen,—You will oblige me by publishing the following supplementary observations to my paper on "Cow-spaying" which appeared in your October number. I should not presume to enter into any veterinary investigation requiring scientific research or learned attainments, but the subject of my communication is entirely a practical one, and refers to operative proceedings, which can only be tested by trial, and their value ascertained by their results; and as these came within my personal knowledge, and I can vouch for their accuracy, I consider it a duty to bring them under public notice, by submitting them to the impartial consideration of your readers and your own editorial remarks.

Allow me a word or two before proceeding to my practical details on the introduction of this new French veterinary operation of cow-spaying. Statistics, it is well known, can be got up to show the converse of any question. According to Mr. Gamgee's statistics, a loss on lean and unspayed bullers which are annually slaughtered in France is estimated to amount to £648,000 sterling. Mr. Charlier, from whom Mr. Gamgee quotes, when he published this statement must surely have been dreaming. The famine in Egypt, following Pharoah's dream of the seven lean-fleshed kine eating up the other seven fat kine, was but a shortlived calamity compared with that, which Mr. Charlier's countless horde of lean bullers would inflict upon his country, if his calculations have not been founded upon "the baseless fabric of a vision," which was, however, not *inspired*.

By pregnant cows, according to the same authority, the loss is calculated to be £48,000 sterling "simply on the calf

and its envelopes." But the quality of the milk is reported to be about one half richer in castrated than in pregnant cows, the latter yielding only from forty to eighty parts of cheese and butter in 1000 of milk, while the proportions of the above were 117 to 150 in the former. The difference in the quantity of milk from spayed cows is computed to be proportionably as great when the prolonged period of lactation is reckoned on, and the increase in the daily secretion. 1st. According to the French ricochety mode of reckoning, a cow fattened while pregnant gives in nine months 2970 quarts of milk, which ceases to flow during the three succeeding months, when the fattening process is completed. 2nd. The cow that is not covered will give milk for fifteen months, and is then fit for the butcher, and will yield during that time 4050 quarts. 3rd. The castrated cow is fat by the eighteenth month, and gives in that period 6750 quarts; and in proof of the extreme nicety of calculation of the quantity given in the course of the lactary process, the following table, taken from Mr. Gamgee's paper, will show the allocation:

For 12 months	15	quarts	per diem	. . .	5400	quarts.
„ 3 „	10	„	„ . . .	. . .	900	„
„ 3 „	5	„	„ . . .	. . .	450	„
	Total				Quarts 6750	

Such wonderful milking cows must be placed in the same category with those dairy cows affected by œstromania, which the professor informs his readers "are termed bullers, and *cannot be stinted.*" Calculations such as these are so utterly speculative, and made with so total a disregard to the modifying circumstances of age, food, constitution, and state of health, &c., which affect the quality and quantity of milk secreted by different cows, and by the same cows at different periods, that they seem to be but little removed from the fanciful computations of Captain Bobadil, to kill an army in the field 40,000 strong, in a given time, with only nineteen backers, provided two important concessions were made, viz., 1st, that his calculations were correct, and that the enemy agreed to his proposed mode of slaughtering.

In my former communication I stated, that in three months after the six cows had been spayed by Mr. Gamgee they were all parted with at a great sacrifice, and their place supplied with new milkers. I may add that these were selected out of one of the largest dairy stocks kept in Fifeshire, amounting to 100 cows, a few more or less. Mr.

Gamgee, of course, would select those most fit and proper to operate upon. His experiments, therefore, could not have been made under more favorable circumstances, and having appealed to persons capable of judging that the operation "*deserves a fair trial,*" and apprising his readers that he was "engaged in *testing practically the truth of* all that had been asserted regarding it," on which he promised "*to report,*" on what ground can he justify his silence in withholding all information with respect to the results of the six operations he performed, having had the fullest opportunity to obtain most authentic particulars, which it was his duty to obtain, and which he must have obtained? He may plead that he only pledged himself "to report on the *advantages* accruing from spaying dairy-cows," and that he was not bound to report on the *disadvantages,* palpable and manifest as these were to him. If he had made a clean breast in testing the truth, to tell the actual results, I should have been spared what I have reluctantly undertaken—the task of publishing what he has suppressed. "The operation not only turned out a failure in every instance"—not one of the six cows continuing in the same thriving state they were in before it—but I was greatly within the mark in merely stating that "all the six cows fell off, both in milk and condition;" for spaying had the immediate effect, not of increasing the quantity of milk, as was asserted, but of almost wholly suppressing it, as the cows became, and continued afterwards, all but dry. The loss from this cause alone was estimated as approaching an average of £5 a head. Each of the cows was reckoned moderately worth £15, and there was a loss of £30, at the very least, caused by the operation, without taking into account the fees charged by the operator. Thus a loss to the proprietor of the animals of nearly one half their value accrued from the operation. The proprietor was a man, fortunately of great wealth, and such a loss was, therefore, not felt by him; but the infliction would have been a very serious one had the owner been a poor dairyman, dependent for his livelihood upon the produce of his cows. The experiment having so unmistakably failed, a stop was put to Mr. Gamgee being further employed in spaying any more of the stock, which would have yielded a rich harvest if the operation had realised the advantages which were held out by him in undertaking its performance.

In writing out the narrative of the six cases, the account of three additional cases operated on by him escaped my memory, and I shall now supply the omission. They belonged to the same stock, and they fell off, after being spayed,

both in milk and condition. The falling off was not to the same degree as in the other six cows; a circumstance readily accounted for, that some cows, from strength of constitution, are more able to resist the shock of the operation, and they were therefore kept longer on before being disposed of, but the manager—a highly respectable and most intelligent and experienced person—informed me that the flesher to whom they were sold complained that the value of the animals was greatly deteriorated and the flesh injured by an enlarged and diseased growth which he found within them, attached to the parts operated upon, after they were slaughtered. What the nature of the morbid enlargement was, I do not pretend to say, but the flesher stated it was of great size, and its seat was connected with the organ to which torsion had been applied. The diseased parts were unsaleable; and if it had been known when the cows were bought he would have hesitated purchasing them in that state.

By pregnant cows Mr. Gamgee states, on Mr. Charlier's estimate, the great loss is simply "by the calf and its envelopes;" but it appears that a greater loss may accrue from diseased growths occasioned by spaying.

The cases I have detailed, I believe, will satisfy every unprejudiced mind that cow-spaying, as practised by Mr. Gamgee, is both a useless and unprofitable proceeding—that it lessens, in place of augmenting the secretion of milk—injures instead of improving the condition of the cows operated on—is occasionally attended with structural derangement and enlargement in the lacerated organs—and does not prevent œstromania. It is, indeed, very questionable whether the excited state of the ovaries may not be rather the effect than the cause of œstromania, and that its seat may be in the other organs of generation, and occasionally caused by tumours and warts in these, which spaying cannot remove. The spaying, as performed by Mr. Gamgee, did not act as a preventive in all the cows, for in one of the six cases referred to by me the cow came and continued regularly a bulling, but what is more remarkable, it did not even destroy the generative process of a cow operated on by him in Glasgow, as reported to me on good authority, for the animal got to the bull, and a bull calf was found within her after she was slaughtered. If such was the case—and I have no reason to doubt it was not so—it is clear that both ovaries had not been removed. As an operation, spaying by internal incision and ovarian torsion deserves to be condemned, not less of its being an utterly useless and highly injurious one, independently that it is very expensive on account of the high fee which is charged, besides

being cruel in the extreme, from inflicting unnecessary torture on a numerous class of animals. On the ground of cruelty alone, more defensible cases, in my opinion, have been taken up by the Society for the Prevention of Cruelty to Animals than the experiment inaugurated by Mr. Gamgee, and its public prohibition should be embodied as a merciful clause in the legislative act for abolishing the system of torture which vivisection has so long disgraced the French Veterinary College at Alfort.

A few words before parting with Mr. Gamgee. That gentleman has been so much in the habit of speaking so disparagingly of his professional brethren, and exalting himself at their expense, as well as of interfering in an unbecoming spirit towards others, like myself, in the more humble branches of the art, that I may claim indulgence for a sentence or two by way of plain and inoffensive admonition. He occupies a high position as the first professor in a newly instituted college; but that position is honorable only so far as the important duties attached to it are performed with good sense, exemplary forbearance, and great discretion. While scientific research and acquisition of knowledge are leading attainments, he should remember that practical information is the one thing needful in a teacher, and that it is his province to use every opportunity in acquiring that which he cannot be thought to possess from want of personal experience, in order to impress on his readers the great advantages which useful, practical tuition imparts in a department of study like veterinary surgery, which is essentially practical, and not speculative. He should lay to heart what that eminently practical surgeon, Mr. Syme, the distinguished professor of surgery in Edinburgh, has said regarding young and inexperienced teachers. "These," he told his patrons, "will take the most certain steps for the mystifying the minds of their hearers, since, instead of giving them well-defined ideas, which, from their 'practical' application, can be fully understood and distinctly recollected, they will bewilder them with a maze of uncertainty and conjecture." Now, Mr. Gamgee acts up to the very letter of Mr. Syme's description of a young and inexperienced teacher. In the printed advertisements published by him in journals and newspapers, he thus addresses himself to the public on the new veterinary college (I quote his own words):—"The object of the establishment in view is to afford more ample opportunity for the cultivation of veterinary science and art, and thus elevating the standard of education for veterinary surgeons, and ensuring a better supply of

well-qualified veterinarians, not only in Scotland, but throughout Her Majesty's dominions" !!! And all this at the time without, comparatively speaking, any library, and with no museum, or collection of illustrative drawings, or staff of officials attached to the college. Professions such as these form no part of the character of a calm, cautious, deliberate inquirer, anxious to accumulate facts to enable him to convey sound instruction. This rage for newly projected operations is to be traced to the same love of notoriety. In place of cautioning his students against undertaking rash and hazardous operations, he rushes himself into the field of action with impetuous precipitancy, thus encouraging instead of repressing the passion for cruel experimenting—a practice which young vets. are so prone to indulge in. The following is the concluding sentence of his paper published "On the Advantages of Spaying Dairy Cows," in the October number of the *Journal of Agriculture* for 1857, page 102 :—"I have procured (he states) the necessary instruments from Paris, and am engaged in testing practically the truth of all that has been asserted, and I hope in time to have occasion to report on the advantages accruing from spaying dairy cows in Edinburgh and other British towns." He thus boldy inaugurates his campaign, proclaims he is armed and ready to carry his spaying operations through the length and breadth of the kingdom. Throwing aside the necessary calculations of the dangers the animals were subjected to from vaginal and peritoneal incisions and ovarian torsions, and ignoring all reflection on its inutility, he took, however, the precaution to protect himself, by a charge of two guineas for every case in which he used the scalpel and extracting forceps, whatever was the result, against any present or prospective loss to himself. With all the high pretensions to honorable fame and reputation, I fear there will be found at bottom little difference between professional and commercial enterprise, especially among those to whom Mr. Gamgee has shown himself to belong, who commences a new trade on his own account, which holds out the greatest and hitherto unknown advantages to the public, while the projector takes good care to secure all the immediate profits of the undertaking to himself. Is this a professional way to put down quackery and empiricism, which he professes so ardently to do, or to "elevate the standard of education," one among the many inestimable advantages which he boasts his college will secure to the students under his tuition, and which no other institution of the kind can supply in Great Britain? It is impossible that a more profitable investment of instrumental

capital could be devised than the one projected by Mr. Gamgee by means of cow-spaying. On the most moderate calculation, there are 2000 dairy cows kept in Glasgow and 1000 in Edinburgh (which is, perhaps, about one half within the number); and, without taking into consideration hundreds of other cows kept in other localities, here are 3000 cows in Scotland alone for Mr. Gamgee annually to operate upon; for he professes to come out as general cow-spayer for North Britain, in addition to his anticipated operative consultations in the populous towns and cities of England; for, to use his own words, he expects his conquest to embrace "London, Manchester, Liverpool, &c.," where, he justly adds, "*it remains to be seen how much good the practice will effect.*" At his usual charge of two guineas for each operation, if employed as he expected, he would have realised a handsome yearly income of £6000 sterling. But I presume England has already heard all that it will ever hear "how much good the operation will effect," and that the practical good sense of John Bull will not be long to discover the truth of the cautious opinion pronounced by the "canny" North—*that the cow-spaying of dairy stock is a great delusion.* And I apprehend, if Mr. Gamgee does not adopt a better tract of inquiry and research, that the patrons of the Edinburgh New Veterinary College will at no distant date come to the conclusion that he is more a speculative controversialist than a practical teacher.

Facts and Observations.

GREAT PREVALENCE OF ECZEMA EPIZOOTICA IN THE METROPOLIS.

During the past few weeks *Eczema Epizootica* has prevailed to a very serious extent in the dairies of the metropolis, and the surrounding districts. Many cows have died, and a far greater number have been disposed of at a great reduction of price in consequence of becoming affected with mammitis, ulceration of the feet, &c., as sequelæ of the malady. The purveyors of milk have been put to the greatest strait to find a sufficient supply for their daily customers, and healthy cows from the country have been purchased by them at fully twenty per cent. above their ordinary value.

DISEASE AMONG THE CAPE SHEEP.

A WRITER in the *Anglo-African Advertiser*, Graham's town, October, 10th, 1861, who signs himself "G. R.," says that "we are informed, on authority which we can rely on, that a new disease or sickness has appeared amongst the flocks of sheep in this and some of the adjoining districts, by which the animals attacked cast their entire fleeces. Rams, wethers, and dry ewes are most subject to it; and as yet, it cannot be attributed to any known cause. No deaths, however, have occurred from it."

DISEASES AMONG THE PIGS IN AMERICA.

THE *Wayne Press*, New York, states that the disease termed "hag-cholera" is raging among the pigs at the distilleries in Clyde. One persons had lost something like 1200 pigs in a short time. The animals are reported to be dying at the rate of sixty to a hundred a day.

AUSTRALIAN DAINTIES.

How far the voracious appetite of the million mouths of modern Babylon may insist on extending the list of edibles only a wild imagination can conjecture, or searching natural science divine. The meat of the eland, the horse, and the ass, have already been pronounced excellent. Letters from Australia open up the vista of a more varied and heterogeneous bill of fare. A banquet of a remarkable character has been held at Melbourne. It was given under the auspices of an Acclimatization Society, set on foot by Mr. Edward Wilson, who has rendered great service to the colony of Victoria by introducing foreign animals, game, and singing birds. The Society, which is described as being now numerous and including several active members, served up a number of the native animals, birds, and fishes. The *carte* comprised kangaroo, wallaby, wombat, bandicoot, opossum, and porcupine, amongst the animals; black swan, wild turkey, paroquet, water-hens, and wattle-birds, amongst the fowls; and most of the fish of the Australian salt and fresh waters. Surely this is deserving the attention of Mr. Lowe and Mr. Buckland, the active and intelligent secretaries of the Acclimatization Society of England, who should by no means waste all their valuable energies in holding meetings, and reading and writing interesting reports.

THE VETERINARIAN, FEBRUARY 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

ADDRESS OF CONDOLENCE TO THE QUEEN.

At the meeting of the Council of the Royal College of Veterinary Surgeons, which took place on the 21st ult., it was determined to present an address of condolence to the Queen, on the irreparable loss which she and the Royal Family have sustained by the death of the Prince Consort. We are much gratified at this step on the part of the Council, and should have exceedingly regretted had it not been taken, as all the advantages which we possess as an Incorporated profession are due to Royal favour; besides which the late Prince was Patron, jointly with Her Majesty, of the Royal Veterinary College. For the first time we approach the throne as a *profession,* and deeply do we regret that it is to express our sympathy with our beloved Queen for her great bereavement. The address, we fear, will not be prepared in time for us to give it in our present number, but it will appear in our next.

APPOINTMENT OF SECRETARY TO THE ROYAL COLLEGE OF VETERINARY SURGEONS.

We have to announce that Mr. W. H. Coates, M.R.C.V.S., late of Gainsborough, has been elected Secretary to the Royal College of Veterinary Surgeons, in the place of Mr. Gabriel. It will be remembered that, in consequence of declining health, Mr. Gabriel was compelled to resign the duties of Secretary several weeks since; and we regret to add that the same cause has since obliged him to vacate his seat at the Council Board and also at the Court of Examiners—situations which he has so long and so worthily filled.

THE PRIZE LIST OF THE ROYAL AGRICULTURAL SOCIETY AT THE FORTHCOMING METROPOLITAN MEETING.

Most readily do we comply with the request to give insertion to the "prize list" of the forthcoming Metropolitan

meeting of the Royal Agricultural Society, although in so doing an unusual demand is made on our space.

This great gathering will doubtless be the event of the year, in connection with the International Exhibition, which will chiefly interest the members of our profession. It bids fair to outvie everything of the like kind that has gone before it, either in England or in any foreign country. One cloud alone rests upon the bright prospect. One which England's sons and daughters all mourn, for it has brought sorrow into every house, and grief to every heart. We need scarcely say that we allude to the death of the Prince Consort, who was this year the President of the Royal Agricultural Society. With him emanated the idea of making the meeting an international one, by giving premiums for the best of the established breeds of foreign cattle, sheep, and pigs. The act bespoke the nobleness of the mind that dictated it, and is but another proof of the deep interest he took in everything calculated to advance England's welfare.

Much as we should like to dwell on this theme, and also to descant on the advantages which will arise from an exhibition of this kind, we must, nevertheless, refrain from so doing, as our pages are already so overcrowded that many articles have had to be put aside.

"*Royal Agricultural Society's Metropolitan and International Show, to be held in Battersea Park, commencing Monday, the 23rd of June,* 1862, *open to general competition.*

"MEMBERS of the Royal Agricultural Society of England, and of the Highland and Agricultural Society of Scotland, have the privilege of making entries on the payment of five shillings on each certificate of cattle, horses, sheep, and pigs; but non-members will be allowed to compete on the payment of fifteen shillings on each certificate.

"Forms of certificates may be obtained on application to the Secretary, at the Office of the Society, No. 12, Hanover Square, London (W.) All certificates for the entry of live-stock must be returned, filled up, to the Secretary, on or before the 1st of May.

"The number, preceding each class, refers to the corresponding number in the certificate.

"All Ages are to be calculated to July 1st, 1862."

PRIZES.

CATTLE.

SHORT-HORNED.

1. Class I.—Bull, calved on or before the 1st of July, 1859, above three and under six years old. 1st Prize, 30*l.*; 2nd, 15*l.*; 3rd, 5*l.*

2. Class II.—Bull, calved *since* the 1st of July, 1859, above two and under three years old. 1st Prize, 30*l.*; 2nd, 15*l.*; 3rd, 5*l.*

3. Class III.—Bull, calved *since* the 1st of July, 1860, above one and under two years old. 1st Prize, 25*l.*; 2nd, 15*l.*; 3rd, 5*l.*

4. Class IV.—Bull-Calf, above six and under twelve months old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

5. Class V.—Cow, above three years old. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*

6. Class VI.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

7. Class VII.—Yearling Heifer. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

8. Class VIII.—Heifer-Calf, above six and under twelve months old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

To the Owner of the best Male Animal in the Short-horned Classes. Gold Medal.

To the Owner of the best Female Animal in the Short-horned Classes. Gold Medal.

HEREFORD.

9. Class I.—Bull, calved on or before the 1st of July, 1859, above three and under six years old. 1st Prize, 30*l.*; 2nd, 15*l.*; 3rd, 5*l.*

10. Class II.—Bull, calved *since* the 1st of July, 1859, above two and under three years old. 1st Prize, 30*l.*; 2nd, 15*l.*; 3rd, 5*l.*

11. Class III.—Bull, calved *since* the 1st of July, 1860, above one and under two years old. 1st Prize, 25*l.*; 2nd, 15*l.*; 3rd, 5*l.*

12. Class IV.—Bull-Calf, above six and under twelve months old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

13. Class V.—Cow, above three years old. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*

14. Class VI.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

15. Class VII.—Yearling Heifer. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

16. Class VIII.—Heifer-Calf, above six and under twelve months old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

To the Owner of the best Male Animal in the Hereford Classes. Gold Medal.

To the Owner of the best Female Animal in the Hereford Classes. Gold Medal.

DEVON.

17. Class I.—Bull, calved on or before the 1st of July, 1859, above three and under six years old. 1st Prize, 30*l.*; 2nd, 15*l.*; 3rd, 5*l.*

18. Class II.—Bull, calved *since* the 1st of July, 1859, above two and under three years old. 1st Prize, 30*l.*; 2nd, 15*l.*; 3rd, 5*l.*

19. Class III.—Bull, calved *since* the 1st of July, 1860, above one and under two years old. 1st Prize, 25*l.*; 2nd, 15*l.*; 3rd, 5*l.*

20. Class IV.—Bull-Calf, above six and under twelve months old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

21. Class V.—Cow, above three years old. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*

22. Class VI.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

23. Class VII.—Yearling Heifer. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

24. Class VIII.—Heifer-Calf, above six and under twelve months old. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

To the Owner of the best Male Animal in the Devon Classes. Gold Medal.

To the Owner of the best Female Animal in the Devon Classes. Gold Medal.

SUSSEX.

25. Class I.—Bull, calved on or before the 1st of July, 1859, under six years old. 1st Prize, 15*l.*; 2nd, 5*l.*

26. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. First Prize, 10*l.*; 2nd, 5*l.*

27. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

28. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

29. Class V.—Yearling Heifer. 1st Prize, 10*l.*; 2nd, 5*l.*

LONG-HORNED.

30. Class I.—Bull, calved on or before the 1st of July, 1859, under six years old. 1st Prize, 15*l.*; 2nd, 5*l.*

31. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. 1st Prize, 10*l.*; 2nd, 5*l.*

32. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

33. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

34. Class V.—Yearling Heifer. 1st Prize, 10*l.*; 2nd, 5*l.*

NORFOLK AND SUFFOLK POLLED.

35. Class I.—Bull, calved on or before the 1st of July, 1859, under six years old. 1st Prize, 15*l.*; 2nd, 5*l.*

36. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. 1st Prize, 10*l.*; 2nd, 5*l.*

37. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

38. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

39. Class V.—Yearling Heifer. 1st Prize, 10*l.*; 2nd, 5*l.*

NORTH WALES.

40. Class I.—Bull, calved on or before the 1st of July, 1859, under six years old. 1st Prize, 15*l.*; 2nd, 5*l.*

41. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. 1st Prize, 10*l.*; 2nd, 5*l.*

42. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

43. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

44. Class V.—Yearling Heifer. 1st Prize, 10*l.*; 2nd, 5*l.*

SOUTH WALES.

45. Class I.—Bull, calved on or before the 1st of July, 1859, under six years old. 1st Prize, 15*l.*; 2nd, 5*l.*

46. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. 1st Prize, 10*l.*; 2nd, 5*l.*

47. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 5*l.*
48. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*
49. Class V.—Yearling Heifer. 1st Prize, 10*l.*; 2nd, 5*l.*

IRISH—KERRY.

50.—Class I.—Bull, calved on or before the 1st of July, 1859, under six years old. 1st Prize, 15*l.*; 2nd, 5*l.*
51. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. 1st Prize, 10*l.*; 2nd, 5*l.*
52. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 5*l.*
53. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*
54. Class V.—Yearling Heifer. 1st Prize, 10*l.*; 2nd, 5*l.*

CHANNEL ISLANDS.

JERSEY, commonly called ALDERNEY.

55. Class I.—Bull, calved on or before the 1st of July, 1859, under four years old. Prize, 10*l.*
56. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. Prize, 5*l.*
57. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 6*l.*; 3rd, 4*l.*
58. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

GUERNSEY.

59. Class I.—Bull, calved on or before the 1st of July, 1859, under four years old. Prize, 10*l.*
60. Class II.—Bull, calved *since* the 1st of July, 1859, and more than one year old. Prize, 5*l.*
61. Class III.—Cow, above three years old. 1st Prize, 10*l.*; 2nd, 6*l.*; 3rd, 4*l.*
62. Class IV.—Heifer, in-milk or in-calf, under three years old. 1st Prize, 10*l.*; 2nd, 5*l.*

HORSES.

63. For the Thorough-bred Stud Horse, having served mares during the season 1862, which, in the opinion of the Judges, is best calculated to *improve and perpetuate* the breed of the sound and stout Thorough-bred Horse for General Stud Purposes. 1st Prize, 100*l.*; 2nd, 25*l.*

HUNTER.

64. Class I.—Stallion, thorough or half-bred. 1st Prize, 30*l.*; 2nd, 15*l.*
65. Class II.—Brood Mare, with foal at foot, or in-foal. 1st Prize, 20*l.*; 2nd, 10*l.*
66. Class III.—Gelding, four or five years old. 1st Prize, 20*l.*; 2nd, 10*l.*
67. Class IV.—Mare, four or five years old. 1st Prize, 20*l.*; 2nd, 10*l*

CARRIAGE.

68. Class I.—Stallion. 1st Prize, 20*l.*; 2nd, 10*l.*
69. Class II.—Brood Mare, with foal at foot, or in-foal. 1st Prize, 20*l.*; 2nd, 10*l.*

ROADSTER.

70. Class I.—Stallion. 1st Prize, 20*l.*; 2nd, 10*l.*
71. Class II.—Brood Mare, with foal at foot, or in-foal. 1st Prize, 20*l.*; 2nd, 10*l.*

AGRICULTURAL HORSES.

SUFFOLK.

72. Class I.—Stallion, foaled on or before the 1st of January, 1860. 1st Prize, 30*l.*; 2nd, 15*l.*
73. Class II.—Stallion, foaled in the year 1860. 1st Prize, 20*l.*; 2nd, 10*l.*
74. Class III.—Mare and Foal. 1st Prize, 20*l.*; 2nd, 10*l.*
75. Class IV.—Two years old Filly. 1st Prize, 15*l.*; 2nd, 10*l.*

AGRICULTURAL.

Not qualified to compete as Suffolk.

76. Class I.—Stallion, foaled on or before the 1st of January, 1860. 1st Prize, 30*l.*; 2nd, 15*l.*
77. Class II.—Stallion, foaled in the year 1860. 1st Prize, 20*l.*; 2nd, 10*l.*
78. Class III.—Mare and Foal. 1st Prize, 20*l.*; 2nd, 10*l.*
79. Class IV.—Two years old Filly. 1st Prize, 15*l.*; 2nd, 10*l.*

DRAY.

80. Class I.—Stallion, foaled on or before the 1st of January, 1860. 1st Prize, 30*l.*; 2nd, 15*l.*
81. Class II.—Stallion, foaled in the year 1860. 1st Prize, 20*l.*; 2nd, 10*l.*
82. Class III.—Mare and Foal. 1st Prize, 20*l.*; 2nd, 10*l.*
83. Class IV.—Filly, foaled in the year 1860. 1st Prize, 15*l.*; 2nd, 10*l.*

PONIES.

Above 12½ *and under* 14 *hands.*

84. Class I.—Stallion. 1st Prize, 15*l.*; 2nd, 5*l.*
85. Class II.—Mare. 1st Prize, 10*l.*; 2nd, 5*l.*
86. Class III.—Gelding, four or five years old. Prize, 10*l.*

Not exceeding 12½ *hands.*

87. Class I.—Stallion. 1st Prize, 15*l.*; 2nd, 5*l.*
88. Class II.—Mare. 1st Prize, 10*l.*; 2nd, 5*l.*
89. Class III.—Gelding, four or five years old. Prize, 10*l.*

SHEEP.

LEICESTER.

90. Class I.—Shearling Ram. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*
91. Class II.—Ram of any other age. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*
92. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*

To the Owner of the best Ram in the Leicester Classes. Gold Medal.

LINCOLN.

93. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

94. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

95. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

COTSWOLD.

96. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

97. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

98. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

KENTISH OR ROMNEY MARSH.

99. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

100. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

101. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

LONG-WOOLLED.

Not qualified to compete as Leicesters, Lincolns, Cotswolds, or Kentish.

102. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

103. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

104. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

IRISH—PURE NATIVE LONG-WOOLLED BREEDS.

105. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

106. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

107. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

SOUTH-DOWN.

108. Class I.—Shearling Ram. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*

109. Class II.—Ram of any other age. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*

110. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, 5*l.*

To the Owner of the best Ram in the Southdown Classes. Gold Medal.

SHROPSHIRE.

111. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

112. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

113. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

HAMPSHIRE AND WEST COUNTRY DOWN.

114. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

115. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

116. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

OXFORDSHIRE DOWN.

117. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

118. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

119. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

DORSET.

120. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

121. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

122. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

MOUNTAIN.

123. Class I.—Shearling Ram. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

124. Class II.—Ram of any other age. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

125. Class III.—Pen of Five Shearling Ewes, of the same flock. 1st Prize, 15*l.*; 2nd, 10*l.*; 3rd, 5*l.*

PIGS.

126. Class I.—Boar of a large breed, of any colour. 1st Prize, 10*l.*; 2nd, 5*l.*

127. Class II.—Boar of a small white breed. 1st Prize, 10*l.*; 2nd, 5*l.*

128. Class III.—Boar of a small black breed. 1st Prize, 10*l.*; 2nd, 5*l.*

129. Class IV.—Boar of the Berkshire breed. 1st Prize, 10*l.*; 2nd, 5*l.*

130. Class V.—Boar of a breed not eligible for the preceding classes. 1st Prize, 10*l.*; 2nd, 5*l.*

131. Class VI.—Breeding Sow of a large breed, of any colour. 1st Prize, 10*l.*; 2nd, 5*l.*

132. Class VII.—Breeding Sow of a small white breed. 1st Prize, 10*l.*; 2nd, 5*l.*

133. Class VIII.—Breeding Sow of a small black breed. 1st Prize, 10*l.*; 2nd, 5*l.*

134. Class IX.—Breeding Sow of the Berkshire breed. 1st Prize, 10*l.*; 2nd, 5*l.*

135. Class X.—Breeding Sow of a breed not eligible for the preceding classes. 1st Prize, 10*l.*; 2nd, 5*l.*

136. Class XI.—Pen of three Breeding Sow Pigs of a large breed, of any colour, of the same litter, above four and under eight months old. 1st Prize, 10*l.*; 2nd, 5*l.*

137. Class XII.—Pen of three Breeding Sow Pigs of a small white breed, of the same litter, above four and under eight months old. 1st Prize, 10*l.*; 2nd, 5*l.*

138. Class XIII.—Pen of three Breeding Sow Pigs of a small black breed, of the same litter, above four and under eight months old. 1st Prize, 10*l.*; 2nd, 5*l.*

139. Class XIV.—Pen of three Breeding Sow Pigs of the Berkshire breed, of the same litter, above four and under eight months old. 1st Prize, 10*l.*; 2nd, 5*l.*

140. Class XV.—Pen of three Breeding Sow Pigs of a breed not eligible for the preceding classes, of the same litter, above four and under eight months old. 1st Prize, 10*l.*; 2nd, 5*l.*

PRIZES

Offered by the Highland and Agricultural Society of Scotland.

CATTLE.

POLLED (ABERDEEN AND ANGUS).

141. Class I.—Bull, calved before the 1st of January, 1860. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

142. Class II.—Bull, calved after the 1st of January, 1860. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

143. Class III.—Bull, calved after the 1st of January, 1861. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

144. Class IV.—Cow, of any age. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

145. Class V.—Heifer, calved after the 1st of January, 1860. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

146. Class VI.—Heifer, calved after the 1st of January, 1861. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

POLLED (GALLOWAY).

147. Class I.—Bull, calved before the 1st of January, 1860. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

148. Class II.—Bull, calved after the 1st of January, 1860. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

149. Class III.—Bull, calved after the 1st of January, 1861. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

150. Class IV.—Cow, of any age. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

151. Class V.—Heifer, calved after the 1st of January, 1860. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

152. Class VI.—Heifer, calved after the 1st of January, 1861. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

HIGHLAND.

153. Class I.—Bull, calved before the 1st of January, 1859. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

154. Class II.—Bull, calved after the 1st of January. 1859. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

155. Class III.—Bull, calved after the 1st of January, 1860. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

156. Class IV.—Cow, of any age. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

157. Class V.—Heifer, calved after the 1st of January, 1859. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

158. Class VI.—Heifer, calved after the 1st of January, 1860. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

AYRSHIRE.

159. Class I.—Bull, calved before the 1st of January, 1860. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

160. Class II.—Bull, calved after the 1st of January, 1860. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

161. Class III.—Bull, calved after the 1st of January, 1861. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

162. Class IV.—Cow, in-milk, of any age. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

163. Class V.—Cow, in-calf, of any age. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

164. Class VI.—Heifer, calved after the 1st of January, 1860. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

165. Class VII.—Heifer, calved after the 1st of January, 1861. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

HORSES.

CLYDESDALE.

166. Class I.—Stallion, foaled before the 1st of January, 1859. 1st Prize, 30*l.*; 2nd, 15*l.*; 3rd, Silver Medal.

167. Class II.—Entire Colt, foaled after the 1st of January, 1859. 1st Prize, 20*l*; 2nd, 10*l.*; 3rd, Silver Medal.

168. Class III.—Mare (with foal at foot), foaled before the 1st of January, 1859. 1st Prize, 20*l.*; 2nd, 10*l.*; 3rd, Silver Medal.

169. Class IV.—Mare (in-foal), foaled before the 1st of January, 1859. 1st Prize, 16*l.*; 2nd, 8*l.*; 3rd, Silver Medal.

170. Class V.—Filly, foaled after the 1st of January, 1859. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

SHEEP.

BLACKFACED.

171. Class I.—Tup, not more than four shear. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

172. Class II.—Shearling Tup. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

173. Class III.—Five Ewes, not more than four shear. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

174. Class IV.—Five Shearling Ewes. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

CHEVIOT.

175. Class I.—Tup, not more than four shear. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

176. Class II.—Shearling Tup. 1st Prize, 10*l.*; 2nd, 5*l.*; 3rd, Silver Medal.

177. Class III.—Five Ewes, not more than four shear. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

178. Class IV.—Five Shearling Ewes. 1st Prize, 8*l.*; 2nd, 4*l.*; 3rd, Silver Medal.

FOREIGN CATTLE.

CHAROLAISE.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

GARONNAISE.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

NORMAN.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

DE SALERS.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

PYRENEAN.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

BRETON.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

OTHER FRENCH BREEDS.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

FLEMISH.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

DUTCH.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

SWISS.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

SPANISH.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

OTHER FOREIGN BREEDS.

Class I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

Class II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

INDIAN OR OTHER NATIVE COLONIAL BREEDS.

CLASS I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

In addition to the above Prizes, SIX GRAND GOLD MEDALS OF HONOUR *will be distributed among the above Classes, at the discretion of the Stewards and Judges.*

HORSES.

HORSES FOR HEAVY DRAUGHT, OF ANY PURE FOREIGN BREED.

CLASS I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

AGRICULTURAL HORSES, USED FOR AGRICULTURAL PURPOSES ONLY.

CLASS I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

In addition to the above Prizes, TWO GRAND GOLD MEDALS OF HONOUR *will be distributed among the above Classes, at the discretion of the Stewards and Judges.*

SHEEP.

FRENCH MERINO.

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

SPANISH MERINO.

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

SAXON MERINO.

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

OTHER PURE MERINO.

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

LONG-WOOLLED FOREIGN BREEDS.

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

SHORT-WOOLLED FOREIGN BREEDS.

(*Not qualified for the above Classes.*)

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CROSS-BRED MERINO.

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

OTHER MIXED BREEDS.

CLASS I. *Ram of any age.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Pen of Three Females.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

In addition to the above Prizes, TWO GRAND GOLD MEDALS OF HONOUR *will be distributed among the above Classes, at the discretion of the Stewards and Judges.*

PIGS.

PURE FOREIGN BREEDS.

CLASS I. *Male.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CLASS II. *Female.*—1st Prize, a Gold Medal; 2nd, a Silver Medal; 3rd, a Bronze Medal.

CONDITIONS, APPLYING TO CERTAIN CLASSES ONLY.

1. No Bull in Class 1, of any of the divisions of Cattle, will be eligible for a Prize unless a Certificate is produced of his having served not less than three different Cows (or Heifers) within the three months preceding the 31st of March in the year of the Show.

2. No Cow will be eligible for a Prize unless certified to have had a Live Calf, either between the date of entry and that of the Show, or within the twelve months preceding the date of the Show.

3. No Heifer, except yearlings, entered as in-calf will be eligible for a Prize unless she is certified to have been bulled before the 31st of March in the year of Show, nor will her Owner afterwards receive the Prize until he shall have furnished the Secretary with a further Certificate that she produced a Live Calf before the 31st of January in the subsequent year.

4. All Foals must be the offspring of the Mare along with which they are exhibited for the Prize.

5. The Ewes in each pen must be of the same flock.

6. The three Sow-Pigs in each pen must be of the same litter.

7. The Judges of Pigs will be instructed, with the sanction of the Stewards, to withhold Prizes from any animals which shall appear to them to have been entered in a wrong class; and to affix a placard of disqualification to the pens of those animals.

8. All Pigs exhibited at the Country Meetings of the Society shall be subjected to an examination of their mouths by the Veterinary Inspector of the Society; and should the state of dentition in any Pig indicate that the age of the animal has not been correctly returned in the Certificate of Entry, the Stewards shall have power to disqualify such Pig, and shall report the circumstance to the Council at its ensuing Monthly Meeting.

9. If a litter of Pigs be sent with a Breeding Sow, the young Pigs must be the produce of the Sow, and must not exceed three months old.

10. No Horse shall be exhibited without a certificate from a Member of the Royal College of Veterinary Surgeons, as to the state of the animal with reference to hereditary diseases, particularly those of the respiratory and visual organs; which certificate shall accompany the Certificate of Entry; but that the above shall not supersede the usual examination by the Society's Veterinary Inspector.

Rules of Adjudication.

1. As the object of the Society in giving Prizes for neat cattle, sheep, and pigs, is to promote improvement in *breeding* stock, the Judges, in making their awards, will be instructed not to take into their consideration the present value to the butcher of animals exhibited, but to decide according to their relative merits for the purpose of *breeding*.

2. If, in the opinion of the Judges, there should be equality of merit, they will be instructed to make a special report to the Council, who will decide on the award.

3. The Judges will be instructed to withhold any Prize if they are of opinion that there is not sufficient merit in any of the Stock exhibited for such Prize to justify an award; should, however, the question of disqualifying a whole class arise, the Judges shall consult with the Stewards of the Yard, and their joint decision shall be final.

4. The Judges will be instructed to give in a "*Reserved-number*" in each class of Live-Stock; viz., which animal would, in their opinion, possess sufficient merit for the Prize in case the animal to which the Prize is awarded should subsequently become disqualified.

5. In the Classes for Stallions, Mares, and Fillies, the Judges, in awarding the Prizes, will be instructed, in addition to symmetry, to take activity and strength into their consideration.

6. The Judges will be instructed to deliver to the Director their award, signed, and stating the numbers to which the Prizes are adjudged before they leave the Yard.

Conditions referring only to the Prizes offered by the Highland and Agricultural Society of Scotland.

1. The Certificate as to Bulls having served Cows, as required by Rule 1 of the "Conditions applying to certain Classes only," will not be required in the Scottish Classes.

2. No Heifer, except Yearlings, entered as in-calf, will be eligible to receive a Prize, until her owner shall have furnished the Secretary of

the Highland and Agricultural Society of Scotland with a Certificate that she produced a Live Calf before the 31st of January in the subsequent year.

3. No Horse shall be exhibited without a Certificate from a Member of the Edinburgh College of Veterinary Surgeons, as to the state of the animal with reference to hereditary diseases, particularly those of the respiratory and visual organs; which Certificate shall accompany the Certificate of Entry; but that the above shall not supersede the usual examination by the Society's Veterinary Inspector.

4. The necessary printed Forms of Certificates may be obtained from the Secretary, at No. 12, Hanover Square, London, W., by persons desirous of exhibiting Live-Stock; who, in their application, are requested to state the distinctive reference-number assigned to each Class in the above general list, and also to state how many forms of Certificate they desire to have sent to them; and no Stock whatever will be admitted for exhibition unless the necessary Certificates, filled in, upon the printed forms prescribed, complete, and signed by the exhibitor (or his agent) in the manner directed, shall have been delivered to the Secretary, or sent (postage free) directed to him, so as to reach No. 12, Hanover Square, London, W., on or before the 1st of May; but Members of the Highland and Agricultural Society of Scotland may obtain Certificates of, and when filled up, return them to, J. Hall Maxwell, Esq., C. B., 6, Albyn Place, Edinburgh.

5. Members of the Highland and Agricultural Society of Scotland (not in arrear of subscriptions) may make entries on the payment of Five Shillings on each Certificate of Cattle, Horses, Sheep, and Pigs; but Non-Members will be required to pay Fifteen Shillings on each Certificate. This payment must be made to the Secretary of the Royal Agricultural Society of England, 12, Hanover Square, London, W.; or to J. Hall Maxwell, Esq., C.B., 6, Albyn Place, Edinburgh, on or before the 1st of May.

GENERAL REGULATIONS.

Certificates.

1. The necessary printed Forms of Certificates may be obtained from the Secretary, at No. 12, Hanover Square, London, W., by persons desirous of exhibiting Live-Stock; who are requested to state the distinctive reference-number assigned to each Class in the above general list, and also to state how many forms of Certificate they desire to have sent to them; and no stock whatever will be admitted for exhibition unless the necessary Certificates, filled in, upon the printed forms prescribed, complete, and signed by the exhibitor (or his agent) in the manner directed, shall have been delivered to the Secretary, or sent (postage free) directed to him, so as to reach No. 12, Hanover Square, London, W., on or before the 1st of May. The Secretary will acknowledge, by return of post, the due receipt of all Certificates received by him one week or more before the 1st of May, and the receipt of all others as soon afterwards as the pressure of business at that time will permit.

2. Members of the Societies (not in arrear of subscription) may make entries on the payment of Five Shillings on each Certificate of Cattle, Horses, Sheep, and Pigs; but Non-members will be required to pay Fifteen Shillings on each Certificate of Cattle, Horses, Sheep, and Pigs. This payment must be made to the Secretary on or before the 1st of May.

3. The Name and Residence of the Breeder of each animal entered for exhibition should be stated when known: or, when not known, circumstantial information given respecting the cause of failure in that item of the Certificate.

4. The age of each animal, calculated up to the 1st of July inclusively, must be stated in the Certificate. In all cases the age of the animal is to be computed from the day of its birth, excepting in the case of Horses, when the year only will be required.

5. The same animal cannot be entered in two Classes, either for the Prizes of the Society or of the Highland and Agricultural Society of Scotland; nor can any animal entered for competition in either of those two divisions be allowed to compete in the other division.

6. In every Certificate for Live-Stock, the exhibitor will be required to sign an engagement to forfeit and pay to the Society the sum of £20, as and for liquidated damages, if the animal, or any of the animals (as the case may be) which he exhibits are, to his knowledge, suffering under any contagious or infectious disease.

Arrival of Live-Stock.

7. No Stock whatever will be admitted into the Yard for exhibition unless the necessary Certificate has been sent to the Secretary by the proper time.

8. All Stock entered for exhibition may be brought to the Show-Yard between the hours of EIGHT in the morning and SIX in the afternoon of Monday, the 23rd of June, and must *all* be in the Yard by FOUR P.M. ON TUESDAY, THE 24TH OF JUNE; none will be admitted after the latter hour.

9. The Parchment Ticket, which will be sent by the Director, must be firmly tied on each animal before it is brought to the Gate.

10. The "Admission Order," which will also be sent by the Director for Stock properly entered, must be delivered to the Gate-keeper of the Yard by the person who brings the Stock for admission.

Departure of Stock after the Show.

11. All Stock must remain in the Show-Yard until after Six o'clock in the afternoon of Wednesday, the 2nd of July, and as much longer as the Director may consider it necessary.

General Rules.

12. No Horse will be allowed to leave the Show-Yard during the *whole period* that the Exhibition lasts.

13. The Society will not, in any case, or under any circumstances, hold itself responsible for any loss, damage, or mis-delivery of Live-Stock, or other articles exhibited at the Society's Show.

14. No animal which has won a First Prize in any Class at a previous Meeting of the Society, will be allowed to compete for a similar Prize at the Meeting at London.

15. No animal that has been exhibited at a Fat Stock Show shall compete for the Prizes of the Society.

16. No person who shall have been shown, to the satisfaction of the Council, to have been excluded from exhibiting for Prizes at the Exhibition of any Society, in consequence of having been convicted of an attempt to obtain a Prize by giving a false Certificate, shall be allowed to compete for any of the Prizes offered by the Royal Agricultural Society of England, at any of its Meetings.

17. Any Prize may be withheld when the Judges are of opinion that there is not sufficient merit in the Stock exhibited for such Prize to justify an award.

18. All Servants coming in charge of Stock will be subject to the orders of the Director and Stewards of the Cattle Yard.

19. No animal can be removed from its place without being subject to a fine of £1, nor can it be taken out of the Show-Yard, without leave in writing from the Director or the Stewards of the Cattle Yard.

20. Exhibitors will be charged £1 for each Cow sent into the Receiving Yard, to supply milk for animals exhibited.

21. In order to prevent the non-exhibition of animals which have been entered for the Show, thus causing unnecessary preparations, expense, and the disarrangement of the Show-Yard, a fine of 10*s.* will be levied for each entry of Stock not exhibited, unless a Certificate under the hand of the Exhibitor, or his authorised agent, be lodged with the Secretary of the Society at least fourteen days before the day of exhibition, certifying that such non-exhibition is caused either by:—(1) The death of the animal or animals; or (2) contagious or infectious disease (confirmed by the explanatory Certificate of a veterinary surgeon). All persons who shall neglect to pay in due course the stated fines incurred for non-exhibition, shall be debarred from exhibiting at the future Country Meetings of the Society.

INSTRUCTIONS TO THE DIRECTOR AND STEWARDS.

1. The Director and Stewards are instructed to take care that no Member of Council, Governor, or Member of the Society, Stranger, or Exhibitor, be admitted into the Cattle Yard, under any pretence whatever, until the Show-Yard is open to the public.

2. The Council delegates full power to the Director and Stewards to enforce all the above Regulations.

3. As soon as the Judges shall, in each case, have made their decision of an award, the Prize Animal shall be distinguished as the winner by different coloured Prize Cards.

4. The Director and Stewards of the Yard are requested to report to the Secretary the names of all persons who shall have failed to exhibit their Stock entered for the Show.

5. The Stewards of the Cattle Yard shall report to the Council annually their observations on the Exhibition of Stock.

PROTESTS.

The Stewards will be instructed to endeavour, if possible, to decide all protests that may be made against the awards of the Judges at the Metropolitan Show, before the conclusion of the Meeting; such protests must be delivered to the Stewards, at the Director's Office, in the Show-Yard, before Six o'clock on the Thursday evening of the Show-week; and no protest will be *subsequently* received, unless satisfactory reasons be assigned for the delay.

*** CHEQUES for the Prizes awarded at this Meeting of the Society will be drawn at the first Monthly Council held in London after the Show; and when duly prepared, registered, and signed, in accordance with the terms of the Bye-Laws, will be forwarded by post to the Exhibitors, to whom they have been awarded.

By Order of the Council,

H. HALL DARE, *Secretary.*

LONDON, *January*, 1862.

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Annales de Médecine Vétérinaire, Bruxelles, Dec., 1861.

ON ERGOTISM.

By M. S. Verheyen.

Ergotism is an affection caused by the use of ergotised rye, as aliment. It makes its appearance under two forms, viz., gangrenous or necrotic, and convulsive or spasmodic. The ergot (*Clavus secalinus*) is considered by the majority of botanists as a variety of fungus which occupies the space of one or more grains in the ear. In oats ergot makes it appearance soon after the blossom. At first it constitutes a soft, yellow, grayish mass, of filamentous cells, which expands its envelope, becomes more prominent, hard, and of a dark purple colour (Tulasne). It is surmounted at its superior extremity by a small yellow, or grayish body, which forms but slight adhesion with it and is shed after a while; this is the *Sphacelia segetum* of Fee and Leveillé, the *Ergotœtia abortifaciens* of Quekett. The ergot itself taken as a fungus is a transitory or preliminary organ of vegetation, which constitutes the stroma of a mycelium and gives birth to the *conidies organes* of multiplication, for they do not carry true spores, except under very rare conditions (Tulasne). Having acquired its full development, the ergot constitutes an elongated curved body, fixed by one end in the centre of the flower; the other, of a truncated conic form, extending beyond the floral envelopes. It is frequently split lengthways and covered with ridges. The colour varies from purple to dark blue or black; the inside is of a dull white with a tinge of purple, which becomes more marked towards the outside; its odour is disagreeable when whole, reduced to powder it is nauseous, its taste is insipid, leaving an acrid metallic flavour behind it. As a therapeutic agent the preference is given to that which has been collected in the same year, as it loses its virtues when old; and being very hygroscopic, it should be kept in bottles hermetically closed, and only powdered when about to be used. Ergot is not exclusive to rye; it is found, though less frequently, on wheat, barley, oats,

maize, or Indian wheat, and canary seed. The gramineæ of the meadows are likewise not exempt from it. Wiggers cites several species on which it is found, and according to De Candolle it is found on all the gramineæ; Galaina adds to the grasses the family of the Cyperuses. In the Brazils, China, and the East Indies, rice is equally subject to it. All sorts of soil may give rise to it, but that which is cold and damp is most congenial to its development, especially in those years in which the atmosphere has been damp and foggy, with much rain, particularly when the corn is in blossom. The influence of humidity is such that the ergot can be produced at pleasure by merely watering the roots of the rye to excess.

Tessier has observed, and others have confirmed, that those fields of rye which do not receive a sufficient isolation, or are exposed to malaria, are always very rich in ergot. Martin, Field, and Diez, assure us that the ergot can be produced by pricking the grains of rye with a needle at the time of their formation. The question of contagion has also been raised, but has not been yet solved, only two experiments having been made. Hertwig suspended some ergot in the neighbourhood of rye in blossom; he also strewed the powder over the ears, without the slightest effect. Wiggers, on the contrary, found the ergot developed on rye at the root of which he had deposited the powder of ergot. Chemical analysis leaves much to be desired. Wiggers has found 1·3% of a reddish, pulverulent, acrid, nauseous matter, insoluble in water and ether, but soluble in alcohol; he considers this the active immediate principle of the ergot, and calls it ergotine. The ergotine of Bonjeau is a soft, red-brown extract, obtained by aqueous and alcoholic digestion of the pulverised ergot, after it has been deprived of its oil by means of ether. This process give 13·3% of ergotine, which has all the properties of the ergot. The analyses agree as to the presence of 36% of fixed oil, which is thick and of a bright yellow colour. To detect the presence of ergot in bread, Wiggers recommends its treatment with ether, which leaves after the evaporation a yellow, oily residue, denoting its presence. The study of the effects produced by the ergot on the organism offers a double interest, as an active morbific agent; it is at the same time a powerful therapeutic remedy.

History.—From the eleventh to the thirteenth century there appeared in France and also in Spain several grave epidemics. The first chroniclers who mention them, true to traditional habit, have confounded them under the generic name of pest. In the tenth century they had received a special name,

and were called "Ignis sacer assura, clades seu pestis igniaria." In the twelfth century this nomenclature had increased to "Ignis sancti Antonii, sancti martialis, Beatæ Virginis ignis invisibilis, seu infernalis." All these expressions only serve to designate one and the same malady, which is nothing more or less than ergotism. The learned historian of the sacred fire of the middle ages, Professor Fuchs, ('Das heilige feuer im mittelalter,' Berlin, 1834,) fixes the first invasion in the year 857. The following explicit passage leaves no doubt in this respect: "Plaga magna vesicarum turgentium grassatur in populo et detestabili eos putredini consumsit, ita ut membra ante mortem deciderunt" (Perzt, 11, 230). The epidemic of 590 (Greg. Tur. x. 30), which some authors have represented as the ignis sacer, does not appear to have presented the characteristics of it. Its progress was of extraordinary rapidity. It began with a slight headache which was the forerunner of death (. . . . ita et modico quisquis ægrotus capitis dolore pulsatus animam funderet). This morbid form can no more be proved to be ergotism than those vague assertions that near Limoges several people had been consumed by the fire of heaven (Feu Celeste), which had also burnt some in Touraine (nonnulli ab hoc igne sunt adusti). At the same time there prevailed an epizootic so destructive that it did not spare even the wild animals. A great drought, which had destroyed all the forage for cattle, was followed by heavy rains and inundations, which were favorable to the development of the carbon. One fact in support of the passage quoted from this chronicle and the opinion of Fuchs, is that rye, being an Asiatic plant, was only introduced into Europe in the middle ages (Links). Admitting, as is supposed, that we are indebted for its introduction to the Huns, we must nevertheless take into account the state of civilisation of that part of the world in order to arrive at the supposition that at the end of the sixth century it should have become so general in Gallia as to become the object of a regular agricultural rotation.

All the epidemics of the ignis sacer correspond with years characterised by severe cold winters, to which have succeeded wet summers, causing failure of crops, scarcity, and famine. These epidemics made their appearance in September or October, and terminated in the spring; unless the condition of the atmosphere was unfavorable for the succeeding crops. There is no mention made of these general epidemics in those years which were noted for their great fertility and abundant crops, sporadic epidemics were however met with, but these were confined to localities where ergotism prevails up to the present time, viz., Sologne, Dauphiné, Lyons, Lorraine,

and Artois. If we take into consideration the conditions which precede an outbreak of the ignis sacer we can establish, *à priori,* that the sanitary state of domestic animals was not more favorable than that of human beings, and that epizootics have been more frequent than is mentioned by the chroniclers. Is there anything in their annals which would indicate that we might be authorised to refer them to the same source, that is to the *ignis sacer?* This question does not admit of a solution. It will suffice to cite a passage out of the chronicle of St. Bavon, which relates to the year 1127: "Plaga divina Franciam affligit ignis scilicet corpora crucians . . . . pestilentia maxima facta est animalium." What was this animal pest? Thus formulated, no one can conjecture. If, in this obscurity, an opinion might be hazarded, we would say that in all probability these animals had not been fed on rye in those calamitous years when famine and scarcity were so general, and when the causes of the ignis sacer were unknown. Therefore the maladies which decimated the herds must have been others than those caused by the ergot. Perhaps the first epidemic which ravaged Portugal in 1189 was an exception; it is thus described: "Hujus etiam tempore morbi nunquam antea visi ingruebant, ferventissimis intra viscera ardoribus, quibus homines quasi quadam rabie exagitabantur. Exorta etiam fauces frugibus tam vi tempestalis, quam verminibus corruptis, et lues non minus nocens pecori quam hominibus, et multorum relictæ vacuæ possessionibus" (C. F. Heusinger, Fuchs). The uncertainty as to the form and nature of the epizootics in the middle ages, is a common fact. Thus the outbreak of the famous black pest in 1347 was preceded, in several countries, by epizootics no less grave. "In primis hæc acerba pestis in brutis animalibus incohavit, scabies et lepræ totaliter oppianabant equas, boves, pecudes, et capras, ita ut pili de dorso ipsorum depilabantur et cadebant, et efficiebantur macri et debiles, et post paucas dies moriebantur. Deinde incipit hæc rabiosa pestis per universum mundum discurrendo in miserabiles lethaliter sævire" (Cutteis).

Evidently the nature of the affection described in the foregoing is gangrenous, and has nothing in common with the ignis sacer, for except in the epidemic of Bretagne, which is coincident with the time of the appearance of the black pest, no traces are found of ergotism until the year 1373, when it reappeared in France (Tessier). During the whole of the middle ages epidemics of the ignis sacer have but seldom broken out in the north of Europe. Heusinger believes that those, from the fifteenth to the sixteenth century, designated by the name of scorbutus, belonged to ergotism. This opinion seems

to be founded in fact. The celebrated botanist Dodonæus attributes the scorbutus which prevailed in Belgium in 1556, and which was characterised by gangrene in divers parts of the body, to deteriorated grain which had been imported from Prussia, and he says in another work ('Historia Frumentorum,' Anv. 1569), that the bread made from this rye determined the malady which the Germans call "schorboet." The gangrenous form of this disease, which was not altogether like that observed in France and Spain, was in the sixteenth century changed into the convulsive form. When a comparison is drawn between the epidemics of ergotism of the north and the south of Europe we find a very remarkable fact, viz., that in the south the gangrenous form is the rule, while in the north gangrene is of rare occurrence. While the convulsive form prevails this phenomenon is applicable likewise to animals affected with ergotism, during the prevalence of the epidemic, and also with those which have been the subject of experiment, with the exception of the gallinaceous birds, in which gangrene of the comb is an invariable phenomenon. The properties of the ergot, it seems then, are not the same in the north as in the south. Comparative analyses will perhaps decide this, meanwhile we may state that it is subordinated by the dose given. In 1840, in Finland, the ergot is said to have amounted to one half of the grain when thrashed; the epidemic developed itself under the convulsive febrile form of ergotism, and death often supervened in forty-eight hours (Haartmann). From the seventeenth century observations have been more attentively made as to the phenomena present in animals during the prevalence of the epidemics of ergotism; but the facts are stated with a terseness which is not satisfactory to observers of pathology of the present time, as they do not furnish the proper elements to retrace their medical history. Brunner, who witnessed the epidemic of 1694, in Hartz, limits himself to the following sentence, "Novi pecora, armenta, sues, equos, anseres, quoque non fuisse a contagione immunia." Notwithstanding the contagion, which he admits, Brunner leaves no doubt as to the cause, for he says, "Degeneravit quoque secale et loco granorum alimentariorum protrusit cornicula nigra." The *quoque* refers to the oats, which had also degenerated, though the character of the change is not stated; the oatmeal produced vertigo in those who ate it. It would have been well if the effect on the horses who were fed on it had also been shown, but there is a complete silence on this point, although distinguished botanists contend that oats are liable to be affected with ergot. We must, however, confess that our

researches to discover the noxious qualities of ergotised oats have been unsuccessful. In the description of the epidemic in Silesia, 1722, we read that the King of Prussia ordered the ergoted rye to be exchanged for some that was not diseased, as the former, as usual, had affected the health of the horses and pigs (Hecker). The convulsive ergotism reappeared in Silesia and Bohemia, in 1736. Soring, its historian, remarks that it is known and confirmed by experiments, that ergotised rye caused sickness both in fowls and mammals. When we find that domestic animals suffer during the prevalence of epidemics we may come positively to the conclusion that there is an abundance of ergot, and we may likewise arrive at the violence of its effects. From 1765 to 1769 the ergot was very abundant in Sweden amongst rye and barley. The epidemics which supervened were attributed by Linnæus to the grains of the *Raphanus raphanistrum*, from whence the name of raphania is derived, which is still applied in Scandinavia to the convulsive form of ergotism. Wahlin, after having demonstrated the innoxiousness of the grain of the raphanus, observes that there is no reason why the ergot should not be accused instead of it, when in the course of an epidemic domestic animals, such as fowls, pigs, &c., present symptoms similar to those in the human subject. This passage tends to prove that not only do domestic animals contract convulsive ergotism, but also that the ergot of barley is as dangerous as that of rye. This is moreover confirmed by Retzius, when he says that beer brewed from ergoted barley has caused convulsive ergotism to those who drank it in quantity. In Hesse it has been often ascertained, to wit, in 1770, that the ears of barley contained as many if not more elongated black grains than the rye. In our time, 1856, the same remark has been made by T. O. Heusinger. Traub, who has left a very valuable account of the epidemic of 1770, which extended greatly over the kingdom of Hanover, says that as far as he was able to ascertain and collect facts by personal observation, that only one pig was affected in the district in which he travelled, and that horses were fed on bread made of ergoted rye with impunity; that beasts which were fed on the meal suffered no inconvenience, though they ate it with repugnance; and that sheep and dogs were also free from the disease, except in the small village of Lohe, where seven sheep died after having presented all the symptoms of the convulsive form of ergotism. These animals had been allowed to run on the stubbles where rye had been gathered in very hot and dry weather, and much of the grain had fallen out. Traub did not meet with a single case of abortion, though Soring and

others say they have observed this amongst the swine. One fact struck him as he was traversing those districts in the spring of the following year; namely, that in those villages which still contained some sick, he heard great complaints respecting the scarcity of chickens, the hens neither laid eggs nor showed any inclination to sit; nothing of the kind was heard of in the other villages which had not been visited by ergotism. Two hens were sent to him, they presented symptoms of spasm. The birds when put on their feet fell on their side, hung their heads, and agitated their limbs, and when they suddenly got up, their phalanges were spasmodically contracted, they sank under the malady in about four weeks; no autopsy was made ('Geschichte der kriebelkrankheit,' 1782). We see that in these epidemics the convulsive form predominated, while in France it was the gangrenous which was prevalent. The last epidemic from which this country suffered was in 1750; the ravages which it made recall those of the middle ages. It began in the Sologne, its traditional hot-bed, and extended to the Landes, Flanders, and Artois. The ergot constituted one third of the rye when thrashed out, and the domestic animals that fed on it contracted the same gangrenous malady as the people (Salerne). Towards the last third of the eighteenth century, epidemics of ergotism have not been so frequent; the improvement in agriculture has contributed much to this happy result, but the principal reason is incontestably the general introduction of the cultivation of the potato in the north, and Indian wheat (maize) in the south. Notwithstanding these alimentary additions, ergotism is not quite extinguished in the present century. Courhaut and Bardot observed it in France in 1855. Barrier also observed the gangrenous form in the department of Isère, the Loire, Haute-loire, Ardèche and Rhône. It has reappeared in Russia, Finland, Sweden, and some parts of Germany. In the epidemic described by Wagner (1831), pigs which had been fed on ergoted rye presented the same symptoms as those of the human subject affected with the epidemic, and Helen saw in Pomerania twelve pigs affected with vertigo and convulsions, which some hours before had partaken of rye mixed with ergot. They groaned and in a plaintive manner emitted anxious cries, the posterior parts were paralysed and the animals manifested their sufferings by curious contortions. The last epidemic, in 1855, which showed itself in Hesse, agrees with that in France described by Barrier. The former had, however, one peculiarity related by Heusinger, junior. He says that his father, the learned professor of the University of Narbourg,

was commissioned by the government to examine the crops of that year; he did so before they were thrashed, and found a large quantity of the *Bromus secalinus* which was very much ergoted, while the ears of the rye were comparatively free from it, and as this ergot has all the physical characters of the ergot of rye, we learn that the latter is not always in fault. The rye which was grown on indifferently cultivated land was infested with the Bromus, while on land on which more care had been bestowed it was comparatively scarce. This fact shows the influence which improvements in agriculture exert over the extinction of ergotism. In a highly cultivated country like Belgium, ergotism, either gangrenous or convulsive, is unknown. The observation of Heusinger does not stand alone; in two villages in the principality of Waldeck the ergoted *Bromus secalinus* caused an epidemic (Roerig). These facts are of great interest to veterinary science, inasmuch as the straw of these plants is largely used as food for cattle and other domestic herbivora. During the prevalence of the epidemic in Hesse, T. O. Heusinger inquired into the maladies which affected the domestic animals, and he learnt that in the commune of Roda, in which convulsive ergotism was very violent, sheep suffered from a sort of intoxication, which could only be referred to the ergot, as they had been fed on rye straw, and the refuse, after winnowing of the rye. The inhabitants complained greatly of the mortality amongst the sheep. The shepherds reported that many of the affected sheep had jumped over the fences, and had afterwards been in convulsions, and turning over fell dead as if struck by lightning. Abortion was also very frequent, as well as premature parturition; the majority also of the lambs died. Dr. Randall reports that in the State of New York there appears every winter a malady among neat cattle which makes its attack by a tumefaction of the lower parts of the hind legs, with stiffness of the articulations. This affection, which seems very benign at first, invariably terminates in a dry gangrene of the parts first affected. In the severe climate of New York the cattle remain out during the winter, and the farmers attribute this affection only to the cold. Randall observes that if this were the real cause, a circular line of demarcation would not so regularly define the separation of the dead and living tissues, and moreover that the external and superior parts of the limbs during the decubitus would first become frozen. He adds, that it is the opinion of several other medical men that this affection is gangrenous ergotism. The *Poa pratensis* is here very rich in ergot, but as the quantity is not every year the same, Randall thinks the affection more or less frequently, corresponds with the

abundance of the ergot (*Veterinarian,* 1842). In the facts enumerated above it is almost impossible not to recognise the existence of ergotism both gangrenous and convulsive amongst our domestic animals. Still we must acknowledge that they do not present that rigorous correlation of cause and effect which the exigencies of pathology demand; they do not even furnish the element of a symptomatic *cadre.* Randall furnishes on this point some valuable information, which agrees with what is contained in the interesting observations of M. Decoste (Rec., 1848). These facts, connected with the phenomena as studied in domestic animals, furnish us with the symptoms of gangrenous and convulsive ergotism; but before proceeding with this question, it is necessary to say a few words on the ergot of wheat and maize. In a memoir presented to the Royal Society of London, 1844, Sydney advanced that the ergot of wheat, although rarer than that of rye, is nevertheless more frequent than is generally believed. That it occurs in damp, clayey land, and that it is more poisonous than that of the rye. This is, however, not borne out by facts, as experiments have convinced Mialhe that their properties are identically the same, and that on analysis the two give the same products. We are indebted to Dr. Rolin for what is known on the ergot of Indian wheat, which is very common in the provinces of Neyba, Marquita, and Columbia. A pyriform body occupies the place of the corn, which the inhabitants have named "mais peladora." People who consume it lose their hair and sometimes their teeth. Pigs lose their bristles, become weak in their posterior parts, and otherwise atrophied. The depilation of mules is simultaneous with the loss of their hoofs. Hens lay eggs without shells. Neither gangrene nor convulsions are, however, observed. Although T. Schudi states that the ergot of Indian wheat is used in the pharmacies of Lima instead of that of rye, the affections which it causes have a greater affinity with the pellagra than ergotism. Since Ballardini has discovered a parasitical fungus on the Indian wheat, *Sporisorium maidis,* many Italian physicians are of opinion that this may be the cause of the pellagra; but these are only surmises which will form a groundwork for further researches.

Veterinary Jurisprudence.

COURT OF EXCHEQUER.

(*Sitting in Banco, before the* Lord Chief Baron, *and* Barons Bramwell, Channel, *and* Wilde.)

M'CAUCE *v.* THE LONDON AND NORTH-WESTERN RAILWAY COMPANY.—CONVEYANCE OF HORSES BY RAIL.

This was an action tried before Mr. Overend, Q.C., sitting as commissioner in the Court of Common Pleas. The declaration alleged that the defendants had contracted to carry the plaintiff's horses from Edgehill, near Liverpool, to Wolverhampton, and that, in consequence of negligence in providing proper trucks, the horses were injured. The defendants paid £25 into court, and as to the rest pleaded never indebted. It was admitted that the plaintiff had delivered three horses, with four others belonging to a person named Keating, who declared that the value of each horse did not exceed £10, and that, in consideration of the charges at which they were to be carried, it would be at the owner's risk. The horses were placed in a truck the bottom of which proved defective, and the plaintiff's horses were injured. If the company were to be held liable in law for their full value the damages would be £65, but if the plaintiff was to be bound by the declared value, then the £25 paid into court was sufficient. At the trial the jury found for the plaintiff for the amount claimed.

A rule was subsequently obtained to set aside the verdict and to enter it for the defendant or for a nonsuit, and it now came on for argument.

Mr. Brett, in showing cause, now submitted that the defendants had annulled the bailment by the payment of £25 into court, and according to the terms of the bailment there was no contract that the value of the horses should be declared, and also that if the note signed was no part of the contract then the defendants could only prove it as an admission of the value of the horses.

Mr. Baron Channel.—If the condition be held to be binding then the company would not be liable for even gross negligence, for the horses are to be carried at the owner's risk.

Mr. Brett.—Yes, my lord; and I have to contend that the condition is unreasonable.

The Lord Chief Baron.—No person is obliged to send his horses by railway.

Mr. Brett.—But the legislature, in framing the act, thought there would be a practical necessity that persons should do so. Since the carriers were taken off the road the railway had a monopoly.

Mr. Baron Bramwell.—In the case of "M'Manus *v.* the Lancashire and Yorkshire Railway," the Court of Exchequer decided that a railway company may refuse to carry, but if they do so the carrying must be on reasonable conditions; but in this case here are two classes of charges, and the sender has his option to pay which he likes.

Mr. Brett said the oppression was this:—The company said to a man he must either pay such a price for carrying his horses as would prevent him from carrying on his trade, or if he did not they would not hold themselves liable for damage.

Mr. Baron Wilde.—The company have paid into court sufficient if

the Court thinks the plaintiff is bound by the declaration that the horses did not exceed in value £10 each.

Mr. Brett, in conclusion, submitted that judgment must be for the plaintiff, and the rule discharged.

Mr. Charles Russell followed on the same side.

Mr. Manisty and *Mr. Quain* appeared in support of the rule, but were not called on.

The Lord Chief Baron, in delivering judgment, said that without saying whether the agreement that the horses should be carried at the owner's risk was a reasonable agreement, he was clearly of opinion that the declaration of the value of the horses was not so mixed up with it as to be void without it. The declaration of the value was false, and had been made expressly with the view of inducing the company to carry the horses at a lower charge. By the reservation of the learned commissioner this Court were called upon to act as a jury; and when a person made a declaration which was false he could not as a juryman find, or as a judge recommend a jury to find, that other value should be set than that which he had himself set, with the view of inducing others to act for his benefit. For these reasons the rule would be made absolute.

The other learned judges concurred.

Judgment accordingly.

BAIL COURT.

(*Sittings at Nisi Prius, before* Mr. Justice Blackburn *and a Common Jury.*)

GAMMEL *v.* FORD.—IMPORTATION OF HORSES FROM IRELAND.

Mr. Pearce and Mr. Willoughby were counsel for the plaintiff; and Mr. M. Smith, Q.C., and Mr. Apsland for the defendant.

The plaintiff was an Irishman, who occasionally dealt in horses, buying them in Ireland and sending them to England for sale. On the 20th of May the plaintiff sent from Waterford twenty horses by the defendants' vessel, the Malakoff, they being the owners of a line of steampackets, to be conveyed by them to Paddington. The defendants' packets were called the Waterford and Milford Haven packets. On the arrival of the horses at Milford they were about to be put into a truck. The plaintiff called the attention of the guard to a hole at the bottom of the truck; the guard said there was an iron plate under the hole, and that there was no danger. The horses were then put into the truck. When the train reached Newport the plaintiff saw that the hole into the floor was enlarged, and he again called the attention of the guard to it. The guard again said that there was no fear. The same thing occurred at Glocester. Between Glocester and Swindon a guard came to the plaintiff and told him that the horses were through the bottom of the truck. The plaintiff went, and saw the legs of the horses dangling through the floor; the guard then got some planks and patched up the floor, and they proceeded. On the arrival of the train at Paddington the horses were examined, and the superintendent told the plaintiff he had better have the horses sold, and they would pay the loss. Six of the horses were injured. The horses were sold at Aldridge's. The fare from Waterford to London was £1 9*s.* for each horse. They were taken in open trucks,

and not in horseboxes. The plaintiff put his mark to a paper which it appeared contained a condition "that the company would not be liable for any risk, for injury from loading or unloading, or for horses being injured from any cause." The plaintiff brought this action to recover the value of the horses.

The plaintiff stated that the paper was never read over to him, or explained to him. He had been in the habit of sending horses in this way for years. The plaintiff had given £143 for the six horses; they were sold for £79 18*s.* 3*d.*

Mr. Smith contended that the horses were carried under a special contract, and that therefore the plaintiff could not recover. The contract, in truth, was that the defendants would not be liable for anything.

The Judge said the legislature had passed an Act nullifying such contract as unreasonable, but they had omitted to include ships.

Mr. Pearce submitted that a receipt was given for the fare. He could not contend that the contract was not entered into; but in railway cases it had been decided that such contracts were illegal.

The Judge said it was a record of the contract, and he did not think it was a question for the jury, but for himself. The risk was that of the owner of the horses. He must direct a nonsuit.—Plaintiff nonsuited.

BATH COUNTY COURT.—Friday, Nov. 15th.

(*Before* C. F. D. Caillard, Esq., *Judge.*)

WARRANTY BY A SERVANT.—JURY CASE.

THOMAS STRANGE *v.* ALFRED RICKETTS, ESQ.

The plaintiff, a livery stable keeper of this city, sought to recover £21 13*s.* 6*d.* from the defendant, a gentleman residing in Lansdown Crescent, for a breach of warranty of a horse.

Mr. Slack appeared for the plaintiff, and Mr. Wilton for the defendant.

Mr. Slack, in stating the case to the jury, said that the plaintiff in the case they were about to try, was Mr. Strange, a livery stable keeper, and the defendant, a gentleman, who was residing in Lansdown Crescent. The question between them arose upon the purchase by Mr. Strange of a horse, in August last. Upon the occasion of the sale there was unquestionably a warranty given that the animal was sound by the party concerned in the sale of it, who was a Mr. Croome, the coachman of the defendant. He (Mr. Slack) thought it would be proved beyond any doubt whatever, that when the sale took place, Croome did represent that the animal was sound as well as possessed of other qualities, which were, however, not material for their consideration; but when the unsoundness, which he should be able to prove did exist at that time, was discovered, it was at once communicated to Mr. Ricketts, who, through his solicitor, Mr. Stothert, said that whatever representations had been made were *bona fide* representations, that was to say, that Mr. Ricketts believed at the time when the sale took place that the animal was just such an one as it was represented to be;

and in the second place that there was no warranty given, and none asked for.

He (Mr. Slack) understood that on the part of the defendant there would be a third pretension set up, *viz.*, that, granted there was a warranty given by Croome, that he had no authority to give it, and therefore Mr. Ricketts was not bound by it; so that he presumed there would be for the jury to decide three questions which were at issue between the parties—First, whether the horse was warranted; secondly, if warranted, whether the party by whom the warranty was given had authority to give it; and thirdly, whether the animal was sound or unsound at the time of sale.

The warranty was in this manner: sometime previous to June Mr. Ricketts was anxious to sell the horse, and on the 1st of June he put an advertisement into the 'Bath Express,' which was in these words—"To be sold, a well-bred bay cob, fourteen hands three inches high, sound, six years old, steady to ride and drive. Apply at Croome's stables, back of Lansdown Crescent, Bath." The same advertisement, with a very little alteration, appeared in the 'Bath Chronicle' on the 6th of June; the only difference between the two being, that in the latter it was said that the "horse was good in harness or saddle, very quiet, and the price forty-five guineas."

These advertisements represented to the world that the horse was sound. An application was accordingly made by his client to Mr. Croome, and then the assurance in the advertisements was repeated in the clearest possible way. It was of paramount consequence in the bargain that the animal should be sound, and Mr. Strange was prepared to give what was commonly called a sound price for the horse Again and again he put the question to Croome whether it was a sound animal, and he said that it was. It was true that Mr. Stothert said that there was no warranty given; but the learned Judge would tell the jury that it was undoubtedly good law, in a case of breach of warranty, that the word warranty need not be used at all; but that if anything was said by the seller to the purchaser in the shape of a representation as to the quality of the animal, it was for the jury to say whether the purchaser was not led by that representation to purchase the animal, and whether it did not amount to a warranty.

Having received this assurance, the animal was inspected by the plaintiff on the 15th or 16th of August. It was at that time at grass at Brislington, and it was ridden home from that place, and delivered at Mr. Strange's stables. Immediately upon that, Mr. Whittington, jun., for whom the animal was intended, received it, and rode it to Swainswick, when he perceived that it limped. He kept it at home one night, and the next day, on trying it again, he found symptoms of lameness a second time apparent. He communicated the fact at once to Mr. Strange, who, finding that there was something the matter with the animal's fore feet, and thinking that the shoes might be the cause of it, had it inspected by Mr. Broad, veterinary surgeon. Mr. Broad, perceiving that there was some tenderness about the fore feet, put on more appropriate shoes, and was in hopes that the animal would be useful for the purposes for which it was required. Again it was tried, and again it was found to be lame, and Mr. Strange then gave it up as a bad job. It was placed in the hands of Mr. Broad, who was of opinion that the animal was suffering from ringbone, which was likely to be a permanent cause of lameness.

This was communicated by letter to Mr. Ricketts, who expressed his surprise that the horse should be unsound, though he would not take it back. Mr. Strange did not ask for the slightest compensation, nor

did he, as some horse-dealers would have done, attempt to make a bargain with Mr. Ricketts. All that he said was this—"I have bought a horse of your servant, who warranted it sound. I have handed it over to the intended purchaser, and it turns out to be quite otherwise. Mr. Broad says it has got ringbone, and therefore I beg to return you the animal, and have my money back."

He (Mr. Slack) was exceedingly sorry that Mr. Ricketts should have viewed the transaction in a different light, and to have refused so fair an offer as this. Mr. Slack read two or three letters written by Messrs. Whittington and Gribble, solicitors, of Bristol, on behalf of the plaintiff, to the defendant, who, however, declined to accede to the terms proposed; and at length, in compliance with an intimation given in the last letter, the cob was sold by auction at the horse repository, Bristol, where it realised, after paying commission and expenses, £13. 7*s*. 6*d*. A letter was then addressed to the defendant, stating that unless the plaintiff received a cheque for £21 13*s*. 6*d*. (the amount due, including expenses incurred for keeping the horse), he should, though very reluctantly, adopt legal measures to compel the payment of the same. As this offer was not complied with, the present action was brought.

Mr. Slack, in conclusion, said that as the defendant had repudiated the action of his servant, the bargain was a void one, and his client therefore entitled to have his money returned.

The plaintiff having been examined in support of Mr. Slack's opening statement, *Mr. Thomas Axtens*, clerk at the 'Bath Chronicle' office, and *Mr. C. M'Leod*, of the 'Express' office, produced the copies of the advertisements above referred to, which Mr. Wilton admitted were in the handwriting of his client.—*Mr. Robert Whittington*, for whom the horse was purchased, spoke as to the lameness which he detected in the animal when trying it, and *John True*, *Benjamin Bailey*, and *William Pettigrew*, servants in the employ of the defendant, proved hearing Croome on separate occasions state that the horse was sound.

Mr. T. Broad, veterinary surgeon, said: Mr. Strange sent the horse in question to me on the 20th of August, and when I examined it the following day I found it was lame of the off fore leg from a bony enlargement round the coronet, which affected both pastern bones; I also observed that the near foot was contracted. From that circumstance and from its style of going, I was of opinion, independently of the enlargement, that it was unsound in its feet, the real seat of the disease being in the navicular joint. [The witness here produced several bones to illustrate the position of the disease.] I should say that the disease in both feet could not have existed for less than three months, though in all probability it had been double that time. The other disease is what is commonly called ringbone; a horse affected with the disease may work for some time, without its being perceptible to an ordinary observer, as the whole of the surrounding structures would become adapted to the enlargement; but when the horse ceases working for a time then the lameness would become apparent. I observed when the horse was in the stall that it was always pointing one of its feet, which is invariably a symptom of navicular disease; the horse was with me five or six weeks; I sent Mr. Strange a bill for £5 11*s*., in addition to which I have a claim of 10*s*. 6*d*. against him for a certificate.—In cross-examination witness said that Croome might have been quite conscientious in saying that the horse was sound, not being aware of the disease, which probably had not then made its appearance.

His Honour.—Ringbone, in your opinion, constitutes unsoundness?

Mr. Broad.—It does, sir,

Mr. Barrell, veterinary surgeon, of Keynsham, having given similar testimony,

Mr. Wilton said, after hearing the veterinary surgeons' evidence, he was ready to admit that there was unsoundness in the cob at the time the animal was sold. He quite agreed with Mr. Slack as to the questions which the jury had to determine: at the same time should they be of opinion that a warranty was given by the coachman without the master's authority, then he (Mr. Wilton) contended that the defendant could not be held responsible, as was shown by the decision in a recent case—*Brayley* v. *Todd*; but if any warranty had been given, either expressed or implied, Mr. Ricketts would not have come into the Court and defended the action.

The coachman, however, denied having said more than he believed the horse to be sound, and advised the plaintiff to see the horse himself, which he had done. He therefore purchased the horse, not upon the contract of soundness, which the advertisement specified, but upon his own personal inspection of the animal, and at a different price to that demanded in the newspapers, and which constituted quite a different contract. Up to within the last three months it had been held that a servant entrusted by his master to sell a horse was empowered to make any representation he thought proper to effect its sale, and that if he warranted the horse the master was held responsible; but the Court above had held in the case in question that there must be a definitive proof of the authority of the master to the servant to warrant the horse at the time of sale.

The defendant was unable to attend from ill health, and the only witnesses examined for the defence were John Croome, the coachman, and Thomas Coller, farrier, who had shod the horse ever since it had been in the possession of Mr. Ricketts, and who said that he always thought it a good useful little cob.

Mr. Slack having replied, *his Honour* summed up with great care, observing with regard to the law of warranty, that any expression of opinion by the seller at the time of sale was part of the contract, and was equivalent to a warranty. Without wishing to prejudice the minds of the jury, he felt it his duty to say that the case cited by Mr. Wilton was quite different to the case at present under consideration, because it simply established this point, that if a gentleman sent his coachman to sell a horse, it did not authorise the coachman to give a warranty without his master's sanction. His Honour then referred to the question of damages, and afterwards epitomised the whole of the evidence, leaving it to the jury to say whether a warranty was given, and if so, whether it was given by the sanction of the master.

The jury retired, and after consulting together for nearly an hour, they informed the Court that there was no prospect of their coming to a decision, as there were three against two on the points at issue, and they therefore prayed to be discharged.

The legal gentlemen engaged at length agreed to comply with the request of the jury, who were then discharged, and it was arranged that the case should either be left to the decision of his Honour, or be tried before another jury next week, if it was not amicably disposed of in the mean time.

OBITUARY.

Died, a short time since, at his residence in London, John Burton Martin, M.R.C.V.S., late of Bakewell. His diploma bears date May 7th, 1836.

Professor Delafond.

It is with the deepest regret that we have to announce the death of Professor Delafond, which causes a great and deep-felt loss to science, and to the veterinary profession at large, There is hardly a veterinary surgeon, however limited his library, who does not possess some of his numerous works, which are a testimony to his untiring labour and researches on every scientific subject, and of his veterinary erudition, which is unfortunately very rare.

All those who have attended his lectures well know how instructive they were, and how much his hearers were benefited by the peculiar talent he had in elucidating his subject. His funeral took place on the 17th of December, and was attended by a great concourse of friends, as well as the representatives of all the scientific societies of which he was a member, also a great number of the civil and military members of the veterinary profession. Funeral orations, in which were briefly traced the arduous labours of the director of the Alfort School, were pronounced by M.M. Renault, Magne, Bouley, the Mayor of the commune of Maison-Alfort, and last, not least, one by a student of the school. This last discourse proved how much M. Delafond was beloved by those who pursued their studies under his direction. The orations will no doubt be published in the *Recueil de Médecine Vétérinaire,* and we shall hasten to reproduce in the *Clinsque,* all we can to the memory of one who has rendered such great services to veterinary medicine, and who, no doubt, would still have rendered many more, as his death may be considered premature, he being only fifty-six years old.—*Clinique Vétérinaire, Dec.,* 1861.

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Communications and Cases.

STRANGULATED HERNIA.—PARALYSIS OF THE PENIS. — IMPACTED ŒSOPHAGUS. — EPISTAXIS FOLLOWING THE USE OF THE TREPHINE. — NECESSITY OF DRAINAGE IN CAVALRY STABLES.—TREATMENT OF CANKER WITH "PLASTIQUE."—DISEASES OF CATTLE IN INDIA.

By J. R. Hoey, M.R.C.V.S.,
V.S. Her Majesty's 3rd Brigade Horse Artillery, India.

(*Continued from p.* 9.)

On looking through an old case-book, over a period of six years only, I find registered twenty-one cases of strangulated scrotal hernia.

In this country cases of this kind are not uncommon, and during a period of twenty-one years in India, I have had a great many of them; but from being removed from regiment to regiment, in accordance with the exigencies of the service, which, I consider to be detrimental to the interests thereof, I have no record showing the whole number of cases in which I have operated, with the results. I give, however, a period of six years, with twenty-one cases operated on.

Twenty of these were troopers, and one an officer's charger. In the very great majority of these cases, the hernia was reduced by opening the scrotum, dilating the stricture, and the gut being returned, it was followed by immediate castration on that side. In all there were only four deaths, and in one of them the animal had been suffering so long, that death ensued without my having a chance of operating successfully.

This, I am thankful to say, seldom occurs, through the efficient system of supervision exercised over the animals; but, still we are liable to this accident occasionally, even where every care is exercised.

And now a word or two in reference to this truly formidable accident. When a young practitioner meets with a case, he knows the danger attending it, that is, if he knows the horse is ruptured at all, and being willing to do anything rather than open the scrotum, he naturally resorts to the taxis, and after labouring away, for I fear to say how long, with one arm up the rectum and the other manipulating as near as possible to the seat of stricture ("mulling," as it is called in Hindostanee), he fastens a cord round the scrotum, high-up towards the stricture, and fancies he has done the trick; that is, he has reduced the hernia; when, in reality, he has only confined the incarcerated gut in a smaller space, and thereby enhanced the danger of losing his patient. Eventually he lets the horse up to find *no abatement,* but rather *an increase* of the symptoms diagnostic of this truly formidable state. And what can be more inconsistent than this mode of practice, so terrible and fatal in its results? Fancy sewing up an animal's eye for ophthalmia, and applying friction so as to bring about its normal state, and this is analogous to the treatment adopted when friction and the ligature are applied to the cord for scrotal hernia; for such treatment is simply irritating an already strictured and engorged intestine, thereby accelerating mortification, to the utter extinction of every hope or chance of success. Every hour lost augments the difficulty. It is true, the animal *may die* after the operation, from more than one cause, but he *must die* if he is not cut, and that speedily, too; therefore, let me urge the necessity of at once casting the animal on his back, with his quarters elevated, and proceeding to open the scrotum as for castration. With a very light hand the operator must carefully and delicately do this, until the testicle bursts forth to view, he will then see the imprisoned and strictured gut. He will now pass his index finger down the cord to the internal ring, and there he will find the stricture so tight as scarcely to admit the point of his finger. If he can sufficiently relax the stricture with his finger, to allow the gut to fall into the abdomen (as I have done in one instance only), well and good, and in this he will perhaps best succeed by keeping his finger through the stricture during the struggles of the animal; but failing such a happy result, he must pass the concealed bistourie, and *very carefully* dilate the stricture, easing the now liberated intestine back into the abdomen.

The wooden clams are then to be put on, and after administering an anodyne draught, the animal is to be released, and fastened up in a quiet box or stall, when the treatment will be the same as that subsequent to castration.

I have just now had two other cases, one in my own corps, a trooper, which was speedily operated on in the usual way, and recovered. The other I was called in to, in consultation here in Landour, and pronounced the operation useless, as the intestine had been strictured for twenty hours. I was, however, assured by the practitioner in attendance, that he had reduced the hernia by the taxis, if it had not come down again. I found the poor animal down with the unmistakeable symptoms of hernia, and a ligature round his scrotum. I had him removed to a convenient place, cast, and secured to the branch of a tree, and proceeded to perform the hopeless operation. About a foot and a half of gut were found in the scrotum, tightly strictured and mortified, which distinctly proved that, at no time from the first occurrence of the accident, had the hernia been reduced. The stricture was dilated, and the mortified gut returned, and my prognosis was verified by the poor brute dying in about an hour after the operation. I must do the practitioner the justice to state that he was not called in, I believe, till fifteen hours after the accident; but I am fully convinced that, had the owner sought medical assistance even a few hours after the accident, the animal would have been saved. I am of opinion that where strictural hernia is reduced by the taxis, there is very little chance of that portion of the gut coming down again immediately. It is only in cases where hernia exists independent of stricture, that this occurs, and in such cases there is no immediate danger. It becomes an inconvenience, and an eyesore, and that is all, but life is not endangered thereby. In this case, the practitioner in attendance hinted at the possibility of hydrocele, but we should remember that in hydrocele the tumour is fluctuating, and in strictured hernia the cord is exceedingly tense, glistening, and hard, and the testicle on that side drawn up tightly towards the seat of stricture.

I was consulted some years ago by an officer at Meerutt, whose horse, a valuable Arab, had a tumour nearly as big as my head between his legs. The horse was the property of Lieutenant Birch, of the Fusiliers. I pronounced him ruptured, and arrived at this conclusion from the fact that the tumour increased or diminished according to the quantity of intestine down at different periods. It was a fearfully dangerous case to operate on, and, had I been permitted, I should

have resorted to the covered operation. The animal was eventually subjected to the examination of others, and the tumour pronounced to be hydrocele. He was finally operated on by a very clever and successful practitioner, who opened the scrotum, when out came such an alarming quantity of gut that the animal died in the hobbles. I merely mention this to show how easily we may be mistaken in our diagnosis, and further to prove how different such a case is from *strictured* hernia. In the latter there is no fear of an alarming volume of intestine overwhelming us, unless by accident or carelessness we dilate the stricture too freely.

Some years ago, when in the 4th Lancers, I had a case of paralysis of the penis, after a severe attack of "bursauttee," a malady peculiar to India during the rains, and which I view as a disease of the blood, wherein we have a deposit of pus, inspissated in the cellular tissue. The penis hung pendulous from the sheath. After all remedial measures had failed, I determined on amputation. I must say I felt rather nervous at the thought of such an operation, and its possible results, but there was nothing else for it, and so I proceeded to perform the operation.

Having prepared the animal by physic, I cast him, and fastened a broad band of tape securely to that part of the organ that was to be left, with the canula introduced as it would remain after the operation. Then I boldly, with two or three cuts, amputated the diseased portion, subduing hæmorrhage with the actual cautery, and was agreeably surprised to find so little hæmorrhage, and so little apparent ground for all my fears. I certainly was never so much taken in in all my life in the issue of an operation that previously seemed so formidable. The animal was returned to his stall—he urinated without any difficulty through a female pewter catheter, secured by tape over the loins, and with very simple treatment, and attention to cleanliness and ordinary dressing, it resulted in a perfect cure, and his return to duty.

The next case I have to relate was a case of plugged or impacted œsophagus. The horse, a ravenous feeder, had eaten till he had plugged the œsophagus from its cardiac portion, nearly up to the pharynx. After endeavouring to pass tepid water as a drench, which was immediately rejected, I tried to pass the probang, which struck as if against a brick wall, but strange to relate, on more than one occasion it passed freely, and anon stuck hard and fast again. I then cast him, he having become inimical to the probang, and was astonished to find it pass again quite easily, and without the

slightest resistance, or spasmodic convulsion, on the part of the animal.

The probang, and that a cattle one, had gone its full length by the trachea into the lungs, and that without the slightest resistance on the part of the patient. Is it possible that the plugged œsophagus had paralysed the epiglottis, which ceased to perform its function, and deprived the parts of their extreme sensitiveness, thus preventing the excessive irritability and spasmodic convulsion that one would expect to ensue on the passing of a cattle probang down the trachea into the bronchi? Strange to relate, this extraordinary anomaly occurred over and over again.

I called in my friend Mr. Barker, Veterinary Surgeon H.M. 7th Hussars, in consultation, who concurred in opinion that there was nothing could be done for the case but the operation of œsophagotomy. The animal was recast, and Mr. Barker performed the operation. An incision was made parallel to and immediately below the jugular vein, the cellular membrane of the subjacent parts loosened with the finger, and the plugged œsophagus exposed to view. An incision of about three inches was now made through the tube, and a probe passed a very little way, after a quantity of grain had been removed, but all to no purpose. Mr. Barker now made an incision lower down, towards the thoracic portion of the tube, and found it plugged as densely as above. We then came to the conclusion that any further attempt was useless, and Barker being tired, I put a few ligatures in the œsophagus and the external integument, and let the poor animal up. He died in ten or twelve hours after the operation. The post-mortem examination exposed the tube plugged from end to end, but no abnormal condition or alteration in the trachea, although the cattle probang had passed into the bronchi over and over again.

The next case is also peculiar. I was called from my hospital late one evening, as it was getting dark, in consultation. I had neither seen nor heard anything of the case in question till that moment. I found a very valuable horse (worth £180), the property of Mr. Allen, of the firm of Peake, Allen, and Co., of Umballa, with his head drooping, general aspect dull, and a stream of blood issuing from the nostril.

The animal had been operated on under suspicion of glanders. The sinuses of the head had been opened by the trephine, and washed out with a dilute solution of nitric acid; the nostril had been slit, explored, and plugged, and the cold douche constantly applied to the head.

It was dark, and by the light of a lantern I could not well diagnose, but I observed that the flow of blood was *continuous*, and *arterial*. There was no coughing or sputa, it could not therefore be hæmoptysis, and I therefore pronounced the possibility of its being epistaxis. I suggested the continuance of the plug, with the application of the compound tincture of benzoin if found necessary, and the cold douche to be continued throughout the night; with other necessary instructions, in case more emergent symptoms should supervene. (I would remark here, how much easier such remedial measures are in the human surgeon's practice than in ours, owing to conformation, and the extent of surface in our patient.) At two o'clock a.m. the bleeding ceased. I saw the animal again, in consultation, early the following morning, and found him feeding. I could detect no submaxillary tumefaction, nor any discharge from the nostril. I could perceive nothing but clotted blood on the Schneiderian membrane, and was consequently puzzled to diagnose glanders. However, I was assured in consultation, that the animal, for some time previous, had every indication of glanders, and we came to the conclusion that it would be better, as soon as the animal could bear a journey, he should be removed, and a tonic course resorted to. It was evident that congestion of the superficial arterial vessels of the lining membrane had taken place, to the discharge of their contents over the surface, and thus the arterial hæmorrhage. At any rate, this was my opinion, and I clung to the idea of epistaxis.

The owner of the horse sent the animal away to another, and just then, more salubrious and fertile station, and he came under the treatment of another professional man, and I heard nothing further about the case till yesterday, when, on conversing with a professional friend here in the hills, and relating this case to him, he exclaimed, to my astonishment, "I had this case under my charge." I questioned him as to his opinion of the disease, and he said that he had expressed an opinion to the owner, that the disease was primarily epistaxis. He did not, however, furnish me with any treatment pursued by him, as he was then in a hurry, leaving the hills, but he told me that he had cured the case, and sent the animal away, but that unfortunately he got wet, and caught a violent cold, when the unfavorable symptoms returned in an aggravated form, and the owner, tired out with all this trouble and anxiety about the animal, had him shot. I must confess, however, I cannot quite reconcile the discharge from the nostril, said to have existed for some time previous to my being called in, in consultation, with

epistaxis, though such a precursory symptom is, I believe, consistent with such a result, and having only seen the case for a few minutes in consultation, I find it difficult to express any decided opinion on it at all, but I hope that should these remarks meet the eye of those gentlemen who had the case under their medical treatment, they will communicate their views, treatment, and result, for the benefit of the profession.

I would finally beg to offer a few cursory remarks, in conclusion, anent the want of proper drainage in our cavalry stables in India, the want of which, in my humble opinion, is so conducive to disease in all its variety of forms. Generally speaking there is such careful supervision in the department, that infectious or contagious diseases do not often, now-a-days, break out among the horses. During the months of November and December last, however, influenza, of a peculiar and typhoid type, did break out among the artillery horses at Umballa, the year having been generally, I believe, throughout India, one of unprecedented mortality; which was attributed principally to the emaciated and diseased state in which the horses joined their regiments from the depôts; these horses, I believe, being generally Walers.

In the disease now alluded to, in my regiment it attacked those animals generally which had joined but a short time before from the remount depôt, and which were in a most emaciated state and sickly condition, so much so, that a general order was considered necessary from the Commander in Chief's office, to the effect that, in future, horses should not be sent from the depôts to the regiments, when they were not in a fit state to enter upon the duties required of them on joining the corps to which they were allotted.

The animals when admitted were dull and off their feed, with œdema and general debility, eyes suffused with tears, drooping heads, mucous membranes injected, skin harsh and coat staring, extremities warm in some instances, but eventually becoming cold, the breath fetid, fæces impacted, and occasionally coated with mucus; in some a very slight pellucid discharge issued from the nostrils, and in others the membrane was almost dry, but there was no swelling of the submaxillary glands, nor any cough. Shortly after admission the pulse became accelerated, and, in many cases, it rose to 90; the œdema of the extremities increased, the mouth became hot and feverish, the breathing greatly quickened, but there was no mucous râle; and the heart thumped against the sides with a peculiar resonant sound.

If these symptoms were not ameliorated, in a few days, about the eighth or ninth the animal sank and died.

Forty cases were admitted in about five weeks, and four of these died.

The treatment pursued was, an inducement to feed by allowing a more nutritive and succulent diet, and the exhibition of stimulants combined with febrifuge medicines. The Liquor Ammoniæ Acetatis cum Spiritus Ætheris Nitrici was given in generous doses three times a day, alternated with fever balls of nitre, tartar emetic, and digitalis; the nostrils were steamed to induce an excess of secretion and defluxion; the throat and neck, and in the more severe cases, the sides, were vesicated with the Linimentum Lyttæ; occasional enemata were thrown up, the extremities swathed in flannel, and the body warmly clothed. This treatment proved most effectual, and on the animals becoming convalescent, the vegetable and mineral tonics were administered morning and evening, and in some of the more debilitated cases arsenious acid was sprinkled on the corn, the quantity being increased as they were able to bear it.

I would bear record to the well-known fact that aloes in such cases is inadmissible. The system is already in a highly debilitated state, as indicated by the excessive œdema, and under such circumstances a purgative is inadmissible. Nay more, I am convinced that a dose of physic under such circumstances is death to the patient, and from the moment the practitioner unfortunately exhibits a dose of aloes he may get ready for a post-mortem examination. Under such circumstances, aloes is poison.

The disease under description was of the epizootic typhoid type, and strangely coincident with it was the fact that typhus fever was attacking at the time some of the men in the Hussar barracks, not far from the artillery lines, whereas there existed nothing of the kind among the men of the artillery, neither did the epizootic appear among the Hussar horses, except I believe in one or two solitary instances, and that after it had totally disappeared from the artillery stables.

The only suspicious circumstance attached to the artillery stables was the fact that the urine had been caught in pots, sunk in the stalls under the horses' bellies; one pot under each horse of eighty or ninety in a stable, as no efficient means of drainage at present exists in our cavalry stables in India. This, added to the impoverished condition many of the horses were in from sickness and dearth throughout the year, added to the heavy draught-work they have to undergo

at this period of the year, rendered them predisposed to such a disease.

The post-mortem appearances in the four cases that died were much the same in all. The lining membrane of the trachea and bronchi was slightly inflamed throughout, of a greenish-brown aspect in some places, added to which was an increased secretion mixed with spume; lungs congested and ecchymosed; liver completely disorganized, of a light clay colour, in fact complete ramollissement of that organ; ulcerations in the stomach, of long standing apparently, with slight effusion into the pericardial sac, the blood abounding generally in serosity. Beyond these there were no other morbid or abnormal lesions.

I had almost forgotten to mention the termination of one case. A chestnut waler had suffered severely, and seemed on the point of recovery, when the disease terminated in metastasis to the feet. Both fore feet were attacked, but from the existing œdema this translation had been so insidious, that it was not detected quite so soon as it otherwise might have been. There was very little time lost, however, when Mr. Gabriel's treatment was put into active operation, but it terminated in complete disorganization of the feet, to the entire separation of the laminæ, and protrusion of the coffin bones of both feet through the soles. At this terrible crisis the animal was shot by order.

I would finally remark, that there was nothing infectious or contagious about the typhoid epizootic, for the horses standing in the hospital were exempt, and in no ways affected by those admitted from the troop stables. But the fact of typhus fever existing among the men is *a significant fact*, and the already existing impurities in the atmosphere could have been in nowise lessened by the addition of a stink-pot under each horse's nose; but until a proper and efficient system of drainage is carried out, there will be no exemption from such attacks.

The government losses have been immense throughout the past year by the death of so many valuable horses, and until proper prophylactic measures are adopted such a result must be occasionally looked for. It would fill a volume to write all that could be offered by veterinary surgeons on this subject, but the drainage of the stable is a most important measure towards the prevention of disease. I have given my opinion on more than one occasion on this point before committees, but nothing has been done as yet. I have suggested that the stalls should be metalled either with "Kunkur," a natural product of this country,—nodules of limestone, of aqueous

origin I believe, with which most of the low plains of India abound, which is as hard as iron, and with which our high roads are made—or with silica brick, laid edgeways, and *very slightly* elevated on either side of the stall, so as to converge, thereby causing the urine to gravitate and empty itself into a drain parallel with the range of stabling, and this again emptying itself into a covered cesspool at one end of the stables, which could be periodically deodorized and emptied. Thus would the diseases of the stable be in a measure eradicated, and a case of canker would be seldom heard of, as well as many other noxious maladies incidental to the horse in his artificial state: and thus I would employ *kunkur* for the prevention of *canker*, and many other diseases of the stable.

By the bye, with reference to canker, I have effected a perfect cure in the most inveterate cases, by adopting the French plan of treatment with the "plastique". A paste is formed by pouring sulphuric acid on alum; this paste when applied fresh, soon becomes as hard as adamant, adapting itself to every crevice. Every particle of fungoid excrescence is pared away daily, and the "plastique" applied evenly over all the diseased parts. I recollect two cases that were pronounced incurable, and were to have been shot, which were perfectly cured by this treatment, and returned sound to their work.

I believe the "plastique" to be the most efficient and effectual remedy we have in this formidable disease, but I do not know that it is in general repute.

I would finally mention that the government cattle (bullocks), are not under the supervision of veterinary surgeons, and I believe, periodically, the government suffers immense losses by the cattle epizootic.

During one of these periodical visitations, two valuable cows, the property of Major Bishop, adjutant of my corps (one a thoroughbred English, and the other a country cow), were attacked with disease. The rumination had ceased entirely, a copious flow of frothy saliva from the mouth took place, the mucous membranes were injected, the head drooped to the ground, the pulse and breathing became accelerated, and the aspect of the animals generally was most dolorous.

Being requested by Major Bishop to prescribe for them, I applied a blister over the sides, and exhibited freely the Potassæ Nitras, alternately with liberal potations of Liquor Ammoniæ Acetatis, and Spiritus Ætheris Nitrici. This, after the subsidence of the febrile excitement, was followed by a course of tonics and nutritious diet, and both animals completely recovered.

I do not pretend to much cattle knowledge, but some of our veterinary surgeons are peculiarly eligible for such appointments in addition to their present charge, with a liberal allowance for the same, of course. And I think that all must agree with me, that such a system would be most conducive to the interests of the government and the well-being of the animals, and that many valuable lives would thus be saved that must otherwise be lost for want of proper treatment.

And now, my dear sirs, I leave these reminiscences of a practical life entirely to your own judgment as to their worthiness or otherwise of a corner in your journal; and with every good wish for its success,

Believe me,

Yours most faithfully.

LANDOUR,
N. W. PROVINCES, INDIA.

A PEDUNCULATED TUMOUR CAUSING STRANGULATION OF THE INTESTINES OF A HORSE.

By HENRY TAYLOR, M.R.C.V.S., Hull.

THE smaller intestines of a horse that I sent to you last week, you will have seen were strangulated in three places, and had a fatty tumour attached to them. These morbid parts were taken from a horse thirty-three years old, belonging to Messrs. James and Sons, of this town, sacking manufacturers.

I have been sent for at different times during the past four years to the horse for various affections, but for the last two years on account of attacks of spasmodic colic, which were always of a very violent character. The last attack began on the 18th, and the animal died the following night at 11 o'clock. Until this time the attacks yielded to the usual treatment with antispasmodic draughts, laxatives, backraking, and relieving of the bladder, which on every occasion except this last, has always been found full of urine having a fetid smell.

The symptoms of each attack of spasms during the past two years have been the same; and at the last one, ending in death, I was fetched at 6 o'clock in the morning, and found the horse had been ill for two or three hours. He was then in a fearful state, knocking about, and lying down again and again. I at once administered the usual antispasmodic draught, and a laxative one also; backraked him, and exa-

mined the bladder, but found it empty. The abdomen was now blistered freely for half an hour, antispasmodics were repeated, and thick hot flannel rugs, dipped in boiling water, applied for half an hour together, so as to keep up the action of the blister on the abdomen. In the afternoon this was repeated, but all proved of no use.

Post-mortem appearances.—The lungs healthy, and the heart also, except a slight flabbiness of the right ventricle. The stomach externally healthy, and the food in a perfect state of digestion, but the mucous coat was a good deal inflamed. All the smaller intestines were as black as possible, with the entanglements or strictures, &c., as sent. I opened the small intestines, and found the coats much thickened, and a good deal of extravasated blood existing both inside and outside the bowels. The liver was of a clay colour, and easily torn with the finger. The large intestines were healthy, and the ingesta natural. The kidneys were soft, and rather light coloured. The bladder was empty and normal.

Should this case be at all interesting to the profession, occurring in so old a horse, and working daily in taking out goods, loading coals to the works, &c., and being the property of one firm from five years old, I shall be happy if you will record it in an early number of the *Veterinarian*.

[The specimen forwarded by Mr. Taylor consisted of a portion of small intestine and mesentery. To the latter was attached a fatty tumour of about the size of a cricket ball, the pedicle of which had encircled and strangulated the intestine. The formation of the tumour was evident, it being due to an original deposit of fat between the layers of the mesentery, which by its weight had put the serous membrane on the stretch, and ultimately drawn it outwards and downwards so as to form a pedicle.

This may be said to be the common method of development of these tumours, but in the present instance the walls were thicker and more vascular than they are generally found to be. At a short distance from the tumour, a second and smaller one existed, which was, however, of a different nature, being hæmorrhagic. It was firmly attached to the mesentery, and likewise to the peritoneal surface of the intestine. It did not, however, seem to play any important part in the production of the disease from which the animal sank.]

CASE OF A PIN FOUND IN THE HEART OF A COW.

By R. Hudson, M.R.C.V.S., Retford.

On the 9th of December the servant of Miss Bigsby, who keeps a dairy farm about a mile from here, came for an aperient drink for a cow, which he said had obstructed bowels from eating inferior hay. He also said that she had lost both cud and appetite. On the 11th he informed me that the cow was no better, and he requested me to come and see her. I found that the aperient had not acted in the least, and that she had passed but little fæculent matter for the last day or two. The fæces which were voided were quite hard and glazed. Two or three days ago she gave a gallon of milk twice a day, but this morning not more than a tea-cupful. Her skin had lost its pliancy and seemed fixed tightly to the ribs; the pulse was weak and quick, the respiration somewhat accelerated, and the horns, ears, and extremities rather cold. The animal was rather low in flesh, and had also a slight cough.

Having satisfied myself that the animal was not the subject of 'pleuro-pneumonia,' I looked upon the case as one of indigestion, associated with constipated bowels. Under these circumstances, I sent another aperient, and also a full dose of oil. I saw her again the next day, and as the bowels had as yet only acted very slightly I repeated the aperient.

On the 14th, I was informed that the bowels were open, and that the cow seemed better, and inclined to pick a few slices of turnips, or occasionally a little hay and cake. She, however, gave no milk. I did not see her again until the 18th, when I found that she had shrunk a good deal in flesh, the respiration was now short and quick, countenance dejected, and the pulse small, with a sharp and wiry feel. I felt certain of something being very wrong, and suspected the heart to be implicated in the disease. The appetite being bad, and rumination suspended, I sent her two doses of carminative and tonic medicine, with some Sod. Sesq. Carb.

On the 22nd, I saw her again. There was no improvement. The bowels were again constipated, and a marked alteration had taken place in the action of the heart. Hitherto it had pulsated feebly, but now it beat louder, and at a distance sounded as though surrounded with water. An oleaginous aperient was given.

On the 24th, the sound of the heart was lost altogether,

except that I could catch a kind of clicking sound now and then, which I thought was produced by the agitation of fluid and not from the heart's pulsation. The jugular veins were full, and felt like a cord. A swelling at the breast from effusion of serum had taken place, also under the tongue, between the jaws, and in front of the cheek extending along the neck. One knee was likewise similarly affected. As her owner was anxious that I should still continue treatment, two more doses of medicine were sent.

I called again on Christmas day, and recommended that she should be destroyed, and asked them to let me know when this was done. Not hearing anything for a few days, and fearing they had put her away without telling me, I called again on the 30th. She was now purging, and completely emaciated. The infiltrations had gone on increasing in size, and she had not lain down during the last eight or nine days. All was silent at the heart, both at the front and sides of the chest, and no pulsation could be detected at the jaw. The jugular veins also were larger.

January 1st.—I was requested to be at the farm by 11 o'clock in order to see her destroyed. Before my arrival, however, as the cow could not move out of the place she was in, they pulled her out with a horse, and she died in the act of being moved.

Post-mortem examination.—On laying open the abdominal cavity, about a couple of gallons of straw-coloured fluid escaped. The stomach was adherent to the peritoneum in one place on the left side, over a small extent of surface, as though the rumen might have been punctured for hoven at some time or the other, but as the cow had been reared on the farm such was known not to have been the case. After carefully removing the ribs on the right side, the pericardium and contents looked nearly as large as a full-sized bucket. Wishing to bring them out entire, and cutting cautiously on the abdominal side of the diaphragm so as to liberate the parts, my knife came suddenly upon some hard substance, which was found to be a shawl pin. The head of the pin was just outside the second stomach, commonly called the honey-comb, while the point had penetrated the diaphragm, and entered the left ventricle of the heart. The stomach was so nicely healed that not a trace of the pin having passed through it could be detected. It lay in a sort of channel formed by adhesions which held that portion of the diaphragm, the pericardium, and part of the left side of the heart intact. The pericardial sac was filled with a whey-like fluid, having an odour somewhat offensive, and in it floated a quantity of loose flocculi

of lymph. The lymph deposit was tolerably firm round the pin, and strongly adherent in most parts to the heart. The muscular structure of the heart was pale, and the general form of the organ so altered in appearance, from pressure, I imagine, that no form at all like the auricles could be found. The pin had entered nearer to the base than the apex of the heart, and traces of something like matter, only rather tougher and more skin-like, could be scraped off the lining membrane of the ventricle, also the chordæ tendineæ, and even some portion of the valves. The channel the pin lay in was lined with a similar material. The lungs were found to be healthy, except an old adhesion on the left side, which had become elongated in the form of a band.

I regret being unable to give a clearer account of the heart's action at the onset of the animal's illness, for having well examined the viscera of the chest, and finding the heart apparently quiet, and a weak pulse existing at the time, I thought if the stomach recovered its healthy action the cow might soon be as well as usual. The tightness of the skin indicated a long-standing disease, but it is not unusual to meet with an unthrifty looking patient, one which you are certain ails something more than a fresh cold, or a disordered stomach, to which you may be administering, which, after being relieved, the old complaint will continue on for a length of time. In concluding this case, I may remark that the cow calved last July, her third calf, a small and bad one, and it still remains so. Since then she had not returned to the bull.

[The pin sent by Mr. Hudson may be rightly described as a shawl pin. It is large, and two inches and three quarters long. It is slightly bent, and from its point, for about two thirds of its length, it is black in colour, this being the part which was located in the wall, &c., of the heart.]

POISONING OF A SOW BY CORROSIVE SUBLIMATE.

By C. Hirst, M.R.C.V.S., Barnet.

I was requested this morning, October 4th, 1861, to make a post-mortem examination of a valuable sow, of the Berkshire breed, belonging to C. A. Hanbury, Esq., of Belmont, East Barnet, which was found dead by the bailiff. The sow,

up to last night, was believed to be in good health. She was then fed in the presence of Mr. Hanbury with the same kind of food as all the other pigs, namely, boiled rice, milk and grains. Upon making the examination, I found some ingesta loose in the abdomen, and on exposing the stomach it was found to be ruptured. On removing the organ, I observed also an ulcerated state of its inner coat. From its appearance, I came to the conclusion that the animal had died from "poisoning, and probably from a mineral poison." How the sow got the poison, if any should be found, is at present a mystery.

In concluding this short account I may state that the sow had won two or three prizes, and was in pig by a very valuable boar of the same breed. She was also within ten days of parturition.

[The coats of the stomach were rent asunder at the upper cardiac portion of the organ, and this allowed of the escape of the ingesta. On examining the mucous coat, an ulcer, evidently produced by some irritating agent, was found to be in close apposition to the torn tissues. Besides this, the general aspect of the mucous coat denoted the presence of some foreign poisonous agent. These lesions induced us to hand the stomach to Mr. Tuson for his analysis, and the following is his report of the investigation.]

REPORT BY PROFESSOR TUSON.

The stomach of a pig belonging to C. A. Hanbury, Esq., together with a very small quantity of its contents, was handed to me for analysis by Assistant-Professor Varnell.

By Reinsch's beautiful process, I was enabled to discover mercury in the ingesta of the stomach, and to obtain that metal in the form of minute characteristic globules. Subsequently a portion of the stomach itself was warmed with distilled water and filtered. In the filtered liquid mercury was readily detected. From the results of this last experiment I should infer that in all probability bichloride of mercury —corrosive sublimate—had been administered to the pig, and doubtless caused its death.

STRANGULATED INTESTINE, AND RUPTURE OF THE STOMACH OF A HORSE.

By G. Cooke, M.R.C.V.S., Newcastle-upon-Tyne.

The animal from which the morbid parts sent were taken was a nice little horse, aged, and about fifteen hands one inch high, the property of Percy Westmacott, Esq., of the firm of Sir W. G. Armstrong and Co., of the Elswick Ordnance Works, near this town.

The horse was of a very quiet temperament, being frequently driven by Mrs. Westmacott; well made, with deep chest, long back ribs, and good loins, and was considered by good judges as a compact little horse, with a capital constitution. He was, however, a gross feeder, and would eat his bedding when he could not get anything better. He had been in Mr. Westmacott's possession for about three years, and was a bad customer to us for medicine, having never had anything but one ball during the whole time he has been in his owner's possession.

A few weeks ago the groom perceived that he had a slight eruption of the skin. I need not enter into the nature of this eruption, as it was of so little consequence as to be scarcely worth notice. He asked his master's permission to give him a dose of physic. The latter objected, saying that the horse ailed too little to require it; that he had an objection to physicking his horses, and that this one had never had any medicine of any kind since he had been in his stable—three years. Eventually Mr. Westmacott, with scarcely any demur, consented that he should have a dose of physic. Accordingly he was, as I am informed, properly prepared, and had a five drachm purging ball duly administered to him. The ball purged him "canny," as they say here, *i. e.*, in English, properly, sufficiently, and moderately. On the morning of the third day, the dung assumed its natural consistence, and the horse fed well during the day, and appeared well when the groom left him for the night.

About midnight of this said third day, a neighbour of the owner of the horse heard an unusual noise in Mr. Westmacott's stable, and promptly apprised him of the fact. He found his horse rolling and kicking about in his stall, and at once sent to our establishment for advice and assistance.

An assistant, who resides on the premises, and in whom

I have the greatest reliance as a practical man, promptly attended. He found the horse evincing symptoms only of a slight attack of common colic, or spasms of the bowels, and he accordingly administered, at proper intervals, the usual antispasmodic draught until three were given, frequently threw up an enema, and applied friction to the abdomen. No relief being afforded by these efforts to alleviate the pain of the poor animal, he very properly came to my house, called me up, and stated the case to me. I immediately went and saw the patient, which I did not find so very impatient as some horses I have attended labouring under colic. His pulse was only slightly affected, but the body was in a profuse sweat under his clothes, he was frequently getting up and lying down, although he would appear easy for a considerable length of time when resting his abdomen upon the straw bed, and he frequently looked round to the off side.

I administered an enema of warm water, but it came back perfectly clear, and was followed by straining, or an effort to expel or void some fæces: always a bad sign. A sinapism was freely applied to the abdomen in a somewhat severe manner, but little or no sensation was evinced, even when it was applied with a considerable amount of friction, and subsequently a thick coating of it was left upon the skin. The jugular vein was freely opened with a broad-shouldered fleam, but we had great difficulty in getting two quarts of blood to flow into a pail, with the usual auxiliary of forcing him to simulate mastication.

My diagnosis was inflammation of the stomach, or some part of the small intestines.

I have always found horses with acute attacks of the organs I have just mentioned, lie quiet for a time, leading one to hope favorably, and I have also noticed that they are never so violent as when the large intestines are the seat of the malady.

When I received my summons to attend the horse, and saw him, I was fully aware that prompt and decisive measures would have to be employed, yet great caution would have to be exercised in an animal that had just got over a dose of physic, therefore I ordered a ball containing ingredients of a gently laxative and anodyne nature, this to be repeated every hour until relief was afforded, or I directed its discontinuance and the substitution of some other medicine. The horse was scarcely ever left during the night of his attack or the subsequent day; but about eighteen hours from the first I discontinued giving any medicine, and pronounced it to be a hopeless case. In six hours afterwards he was dead.

I made a post-mortem examination a few hours after death, and I forwarded to Professor Spooner the ruptured stomach, and a fine specimen of strangulated intestine. But as I was in a hurry to catch the train, coupled with a desire that it should not be unravelled until it had been placed in your hands, through Professor Spooner, by whom the changes that had taken place would be expounded in far more eloquent language, and in a manner greatly superior to that of a provincial veterinary surgeon in hard practice, I really did not take the trouble to observe whether it was a portion of the duodenum, jejunum, or ileum, that had become strangulated.

I shall be exceedingly glad to hear your opinion on this case, as one would naturally suppose that a dose of physic operating upon a horse properly, and that horse a sound, hardy, healthy animal, would not so increase the peristaltic action of the intestines, as to tie the latter into a knot, similar to a cravat on our necks. Many people are very averse to purging their horses, and there is no doubt that great care should be taken both in their preparation and treatment whilst the medicine is operating, and likewise for a few days afterwards. Physic is often blamed for killing horses. "Let well alone" is my maxim, and don't be always ramming balls down a horse's throat!

Permit me, before closing this long epistle, to mention one more case, as we are on the subject of purgatives, commonly called "physic." A gentleman living some miles from Newcastle, has some of the finest horses in England. They are the perfection of condition, and he has also one of the best stud grooms in this county, or any other. A few days since he gave one of his horses a purging ball, for the purpose of making him "better than well;" nothing else, as he ailed nothing. It operated well, set properly, and the horse took his exercise in clothes, on the fifth day. On the sixth day, after again exercising the animal in his clothes, I was sent for professionally in a hurry, when I found he was labouring under a severe attack of tetanus, and so acute that the owner thought it most humane to destroy him, which was accordingly done. Both the owner and his groom assured me that the horse had not been injured in any way. The weather was cold and damp.

[A lesion existed in the stomach, near to the pylorus, through which the hand could be thrust. Apparently it had been caused by a simple giving way of the coats of the organ during the animal's struggles, it being at that time distended with gaseous compounds. The portion of the small intestine

and mesentery showed that two fatty tumours existed on the latter, near to the attached border of the intestine. They were placed one on either side of the mesentery, and directly opposite to each other—a peculiarity which we have never before witnessed. One of the tumours had, seemingly by its weight, torn through the mesentery contiguous to the place of its location; and although having only a very short pedicle, it had nevertheless encircled the bowel and produced the fatal strangulation.

This tumour was rather larger than the other, and more elongated in form.]

BOTANY AS APPLIED TO VETERINARY SCIENCE.

By W. Watson, M.R.C.V.S., Rugby.

(*Continued from p.* 19.)

The next plant we shall proceed to describe as yielding a supply of food for our domestic animals, is the *potato* (*Solanum tuberosum*), which, although much more extensively cultivated as food for man than animals, is nevertheless well worthy of our attention, as it will enable us to bring under notice another great subdivision of Exogens, and to the veterinary surgeon one of the most important natural orders in the vegetable kingdom.

The *Solanum tuberosum* (potato), like all the other plants we have noticed, whose roots or stems yield food for animals, belongs to the class of Exogens, and to the only remaining subdivision of that class not yet described, viz., *Corolliflora:* "Flowers furnished with both calyx and corolla, the latter consisting of united petals," and to the natural order *Solanaceæ* (nightshades), which may be known by the following characters:—"*Calyx* five-parted, persistent, inferior; *corolla* monopetalous, hypogynous; the limb, five-cleft, regular or somewhat unequal, in æstivation plaited or imbricated; *stamens* inserted on the corolla, as many as the segments of the limb, with which they are alternate; *anthers* bursting longitudinally, rarely by pores at the apex; *ovary* two-celled, with two-polyspermous placenta; *style* continuous; *stigma* simple; *pericarp,* with two or four or many cells; either a capsule with a double dissepiment parallel with the valves, or a berry with the placentæ adhering to the dissepiment; *seeds* numerous; *herbaceous* plants or

shrubs; leaves alternate undivided or lobed, sometimes collateral; the floral ones sometimes double, and placed near each other; *inflorescence* variable, often out of the axil; the *pedicels* without bracts."—*Lindley.*

"So far as European Flora is concerned, this order is sufficiently characterised, by its superior many-seeded ovary, axile placentæ, and regular flowers, and by having the same number of stamens as there are lobes to the corolla, upon the sides of which they grow."—*Lindley.*

The plants of this order chiefly inhabit tropical regions, although many are found in temperate climates. The leaves of most of the species are of a dark green colour, and have a disagreeable smell. "The juices of many are powerfully narcotic; the fruit of a few is very hot and most violently pungent, while the fruit of two or three is culinary or otherwise esculent; and the tuberous roots of one are the well-known potato."

Although when considering the poisonous and medicinal plants I shall again have frequently to refer to this very important natural order, I would particularly direct attention to it as being one, which of all others, is the most likely to be brought under the notice of the veterinary surgeon, and an acquaintance with which will prove of great practical utility. This will be at once apparent when I name a few of the plants that belong to this order. Amongst the powerfully medicinal and poisonous plants we have the "*Atropa belladonna*", (deadly nightshade), *Hyoscyamus niger* (henbane), *Nicotiana tabacum* (Virginian tobacco), *Datura stramonium* (thorn apple), *Solanum dulcamara* (woody nightshade), *Atropa mandragora* (mandrake), &c.; amongst the plants used in domestic economy are, the *Capsicum annuum* (capsicum or chilli), *Solanum lycopersicum* (love-apple or tomato), and the *Solanum tuberosum* (potato); and amongst the plants which add floral beauty to our gardens, will be found the *Petunias, Verbascum*, &c., &c.

"*Solanum tuberosum* (the potato), *roots* creeping and tuberous; *stems* winged; *leaves* interruptedly pinnated, with somewhat heart-shaped, ovate, downy leaflets, oblique at the base; flowers no terminal corymbs."—*Lindley.*

This very valuable plant was introduced into this country about the year 1693, from South America, and has continued ever since, under the influence of cultivation, to yield a great number of different varieties, all more or less valuable as food, both for man and animals; and although in seasons of great plenty it has been given to horses and cattle, it should always be previously boiled, and mixed with other food, and is even then liable to produce indigestion, flatulence, &c. &c

The potato is also valuable for the quantity of starch or flour obtained from it; this being largely used when mixed with wheat flour for making bread. Sugar, resembling grape sugar, is likewise made from it, readily undergoing fermentation, and yielding alcoholic products. "A beautiful yellow dye, both solid and durable, is obtained from the flowers of the potato plant, and a dye of a gray colour is yielded by the juice of the potato."

The following is an analysis of the potato—

Starch	64·20
Dextrin	2·25
Saccharine matter	13·47
Albumen, Casein, Gluten	5·77
Fatty matter	1·00
Fibre or husk	13·31

With this I shall conclude my observations on the plants whose roots, leaves, and stems, yield food for our domestic animals. In no department has the science of agriculture been employed of late years with greater benefit than in this, and we may rest assured that as attention still continues to be directed and investigations carried on in this important subject, many plants, which like the carrot and turnip in their original state are equally insignificant, and equally obscure, will, under the influence of cultivation, be brought to yield a valuable supply of food for animals, and be placed side by side with those which already bear such evidence of its success.

(*To be continued.*)

SHOEING OF HORSES IN INDIA.

By a "Subscriber."

Gentlemen,—As the "Principles and Practice of Shoeing" is a subject apparently occupying much attention at home just now, I think a little information with reference to the system obtaining out here, where natives are generally employed to do the work, may not be out of place.

To begin at the beginning, then:—In taking off the old shoes the buffer is used to cut the clenches, and if the shoe does not readily come off each individual nail is drawn out with the pincers. In paring the foot, only the exfoliating

horn of the sole and frog is removed, the heel is not opened, and the bars are not cut away. Of course the wall and toes are reduced as much as the month's growth renders necessary. The shoe used is a very plain one. It is of the ordinary breadth, but about one fourth lighter than those commonly used in England. It is made of equal thickness all round, with a single clip at the toe; is slightly fullered, is *not* "seated," and is attached with six countersunk nails. The shoe is made to fit the foot exactly at all points, no projections at the heels being allowed.

In attaching the shoe the nails are driven low and obliquely, the points of the nails wrung off with the pincers, a little notch is cut below each with the knife, and the clenches laid down. The rasp is not allowed to be used to the crust, except in *close* proximity to the edge of the shoe after putting it on, and on the ground surface of the foot when the shoe is being fitted. The shoes are made and turned out in the rough state by the native blacksmith, and so are the nails. The nalbund (native shoeing smith) finishes, punches and fits the shoes, and points the nails, without heating them. All his work is done with the iron in a perfectly cold state. The process is not a very elaborate one certainly to the eye of an Englishman, but the result is satisfactory.

Corns are of very rare occurrence, and pricks seldom, very seldom, occur. Cases of navicularthritis are not often seen, and laminitis almost never. Shoes are as a rule never cast or nails lost. We have some cases of contracted feet, but the cause I consider to be the hereditary predisposition of the stud-bred horses, for Walers and Capes never get it. We have much less to complain of in the way of diseases of the feet than people at home. Sandcrack is, I am sorry to say, but too common; but then the cause is attributable to the hard, dry, sandy soil—the dryness, if I may so speak, of the climate, and the excessive heat prevailing during seven months of the year.

The shoeing is entirely under the orders and superintendence of the veterinary surgeon, and he is answerable for it. In the Queen's British cavalry regiments the shoes are put on by the English farriers, but in the late regiments of Bengal European light cavalry natives did the work until very recently; and in the late Bengal Artillery (now Royal Artillery) natives only shoe the horses. There is a farrier major to each brigade of horse artillery, and two English farriers to each battery of horse and foot artillery, who receive the veterinary surgeon's orders, and see that the native shoeing smiths carry them out. These farriers do not shoe,

but I imagine they will soon have to do so, according to the Royal Artillery system; but of course a farrier serjeant, and six shoeing smiths, will then be allowed to each battery, instead of only two farriers as at present.

In some regiments the horses are not shod behind at all, except when on the line of march on hard roads. In the Artillery, the leaders and centre horses are only shod before in cantonments, but the pole horses, and those ridden as detachment horses, are shod all round. The object of not shoeing behind is to render the effects of kicks less serious. The feet are not found to suffer from being without shoes while employed in ordinary parade work on the grassy plain, or even where the soil is sandy.

In conclusion I would submit, that the more we simplify the shoes of horses and the mode of attaching them, having of course due regard to the anatomy and physiology of the foot, the more satisfactory will be the result to the animal, to his owner, and to ourselves. I think a very unnecessary fuss is made about this well-worn subject of shoeing horses. Our chief aim should be to divest our minds of all hobby-horse theories, and to follow the dictates of common sense, united with scientific knowledge and practical experience.

I am, gentlemen,

Yours very truly.

To the Editors of the 'Veterinarian.'

PARTIAL DIVISION OF THE TENDO PERFORATUS AND PERFORANS, THE RESULT OF AN ACCIDENT.

ULVERSTONE; *February* 5, 1862.

MY DEAR SIR,—I forwarded you yesterday a portion of the tendo perforatus and perforans of a horse, the history of which case is as follows. On the 10th December, 1861, I was requested to attend a brown, half-bred horse, fifteen hands high, and four years old, the property of the Lindal Moor Mining Company, of the value of forty guineas.

Upon reaching the place, which was eleven miles distant, I found upon enquiry that the horse had been sent there for the purpose of being broken to saddle and harness, and that he was of a very sullen and extremely irritable temper. He was led out into the yard for the purpose of putting the harness on him, and whilst this was being done, he very suddenly threw himself down, in doing which the foot of the

near hind leg caught an iron hoop, known as a wheel nave—the hoop was about nine inches in diameter, and made of very strong material, and was standing against the wall—and brought it down upon the leg, causing a wound which had bled very profusely.

Upon examination I found the breaker's remarks perfectly correct, as regards the temper of the horse, for when an attempt was made to lift or even touch the leg, he kicked most violently. I found a transverse wound to exist nearly an inch and a half in length, and about three inches above the pastern joint, and upon introducing my finger into the wound I found the tendo perforatus and perforans divided, with the exception of a small portion about the thickness of a wheat straw. Of course when the animal rested his weight upon the foot, it was unable to sustain it, and the pastern joint came nearly in contact with the ground. I applied Tinct. Arnica lotion, and cold water linen bandages.

On the following day I saw the horse, and contemplated adopting some mechanical contrivance for supporting the leg. As for removing the shoe and substituting a high heeled one, I found that was out of the question, unless the horse was first cast. Taking into consideration that by doing this we should break down the remaining portion of the tendons, I resolved to do nothing more than pursue the same treatment as before. The bandages were applied from the hock to the coronet, and a gentle dose of physic was given.

I saw the horse on the 16th, and he appeared to be doing favorably.

On the 25th January the leg was very weak, and the horse unable to bear much weight upon the foot when the bandages were removed. The tendons were evidently uniting, but were very elastic and felt soft to the touch; for which you will account upon examining the specimen. The leg felt cool, and the wound had healed, the mark of which could be scarcely discovered. I applied a gutta-percha splint, softened with warm water and moulded to the leg, which appeared to give support to the limb, and I enjoined perfect rest. I also left instructions with the person in charge to write to me in three days, and let me know the effect; he accordingly complied, and informed me that he thought the splint was of very little use. I ordered a leather boot to be made, and intended to have applied it, and also a high heeled shoe, but to my surprise I was informed that another practitioner had been called in on the 1st February, who gave as his opinion that the tendons were still divided, and also the suspensory ligament, and that the animal was incurable and would never be fit for work again.

I therefore received a message that the horse was to be destroyed. I need make no remarks upon the result of the dissection, which proved his diagnosis incorrect, further than that the tendons had been divided, and had retracted in their sheath fully two inches. On examination, the theca and ends of the tendons were united by fibrous deposit. The suspensory ligament was not divided.

The insertion of this case in the *Veterinarian,* with your remarks upon it, would be highly valued by me, and your replies to the following questions would be esteemed a favour.

1st. Taking into consideration the partial division of the tendons, the irritability of the animal, and his violence if approached, was I not justified in ordering perfect quiet, instead of having recourse to casting, in order to remove the shoe, and substitute a high heeled one?

2nd. Would the deposit between the ends of the tendons have contracted, or undergone any change of structure, so as to have become tendinous, and rendered the horse fit for slow work?

3rd. Would the fact of the adhesions of both tendons prevent the horse from walking or trotting, without pain or inconvenience?

4th. Had the high heel shoe been applied at the onset, would the ends of the tendons have come nearer in proximity?

I remain, dear Sir,
Yours respectfully,
W. D. Bray.

To Assist.-Professor Varnell,
Royal Veterinary College.

REMARKS ON THE ABOVE CASE BY ASSISTANT-PROFESSOR VARNELL.

Judging from the appearances presented by the specimen sent, I have no hesitation in saying that had the horse from which it was taken been allowed to live, he would have become useful to his owner, and repaid him for the outlay of his keep while a cure was being effected. This, however, is taking a pound shillings and pence view of the question, and it is the only one we can expect proprietors of horses to take in general. I also feel persuaded that such calculations should, as a rule, be considered by the veterinary surgeon, before advising what course should be adopted in all doubtful cases.

The age of the horse from which the specimen was taken, the nature, and situation of the wound, and the facility with

which divided tendons heal, fully justified Mr. Bray in undertaking this case.

In the few remarks I have to make, I shall first allude to the specimen, and through it judge as to the probability of the case terminating favorably, or not.

The parts sent to me consisted of portions of the perforatus and perforans tendons, with the intervening new material, which had been thrown out for the reparation of the lesion. Altogether it measured about seven inches in length. The accidental division of the tendons seems to have taken place about three inches above the sessamoid bones, which would be a little above the *bursa* common to these tendons and the bones just alluded to, and which fortunately were not interfered with by the accident. The outer surface of the specimen, including portions of the original tendons and the whole of the new material, gave no evidence that diseased action was going on. On the contrary, it was covered by a sort of fibro-cellular sheath, which appeared to be quite healthy. The cut ends of the tendons were slightly enlarged, and a little reddened, due partly to increased vascularity and partly to *stain*, the results of effused blood at the time the wound was inflicted. The new substance, which encroached a short distance upon the outer surface and between the original tendons, was quite as large and as abundant as could be desired, for the purpose of efficient reparation. (I have seen instances where the effused matter was, to a very great extent, insufficient for this purpose). In consistence it was soft and pulpy, but not more so than might have been expected at the stage of its development.

Having made a longitudinal section through the whole length of the specimen, thereby exposing the interior both of the original and the intervening new substance, I found that throughout the whole of this section the reparative process was, as far as I could judge, going on satisfactorily. The slight stain and redness, observable on the outside of the tendons opposite to their cut ends, also existed upon the cut ends of their fasciculi, but were more marked upon those of the upper than the lower; which is easily accounted for.

I have not examined any part of the new portion, otherwise than by the unaided eye, but as far as this investigation went, the process of its being converted into structure identical with the original (but differently arranged) was fast advancing.

So much for the short, and by no means minute, examination of the specimen sent to me by Mr. Bray; and supposing the new structures not to have been removed from their original situation, it would, without great contraction, have

been much too long, but my experience in *tenotomy* convinces me that this newly-formed portion would, in the process of time, have contracted at least two thirds of its length of the tendon. And as the bruised state of the fibres, in consequence of the rough way they were divided, would become detached for a short but indefinite distance, and eventually removed, we may suppose that when consolidation and contraction had fully taken place, the tendons would have been very little too long; and after a time, perhaps, by kind treatment of the animal and careful management, a high-heel shoe might have been placed on the foot, which, doubtless, would have favoured the shortening process.

The movement between the two tendons, when in a normal condition, is but very little at this part of their course, but whatever it may be, it would have been impeded by such lesions as the above, and therefore it must have caused slight defective action of the leg. Nevertheless for slow work this defect would not have materially interfered with the usefulness of the animal.

The advisability of casting the horse under the circumstances alluded to by Mr. Bray, could best be determined by him. If a small portion of one of the tendons remained undivided at the time he first examined the wound, it should, if possible, have been preserved, as it would have tended to some extent to prevent the retraction of the tendons. But I have no doubt it eventually yielded to the stress thrown upon it, as there is no indication of its existence in the specimen. Perfect rest, and the approximation of the divided ends of the tendons, by the application of such means as would tend to keep them near to each other, would have been most desirable. If this could not have been accomplished without a risk, then such means only as could have been used with safety should have been resorted to; which I dare to say was the case.

Taking a retrospective view of the case, as described to me, and also judging of the nature of the lesion by the specimen sent, I cannot but think that the horse ought not to have been destroyed. Still the veterinary surgeon who advised such a course to be taken, might have had reasons for so doing that I am not in possession of. All I know of the case, and the collateral circumstances connected with it, are from Mr. Bray's description, and from this, I have come to the conclusion that the horse might have become fit for moderately slow work, in from three to four months from the time the accident occurred, had all gone on favorably.

The four questions propounded by Mr. Bray, are answered in the substance of the remarks I have made.

Facts and Observations.

NEW LOCAL ANÆSTHETICS.

M. Fournié has found, after a number of experiment performed both on himself and animals, that the mixed vapours of acetic acid and chloroform act as a local anæsthetic. A thin glass flask is to be about half filled with a mixture of equal parts glacial acetic acid and chloroform. This being held in the hand, the temperature of the place being 62° F., on the application of the orifice of the flask to the skin, complete insensibility of the part will be attained in five minutes, and with only very slight pain.

M. Martenot prefers the application of a mixture of 20 parts of camphor and 30 of chloroform. This is to be applied for fifteen or twenty minutes, and then covered with a piece of thick linen and some oiled silk, to prevent its evaporation.

PREVENTION OF THE DISEASE IN POTATOES.

As a preventive of disease in the potato, M. Lemaire has found a mixture of 2 parts of coal tar with 100 of earth, strewed over the soil, and dug in eight inches deep before planting the tuber, to be most effective. In all probability the creasote contained in the tar prevents the development of the fungus.

THE POWER POSSESSED BY PLANTS TO REJECT POISONS.

Dr. Daubeny lately read a paper on this subject before the *Chemical Society,* in which he states that he introduced into the soil before the seeds were sown, the nitrates of baryta and strontia, and arsenious acid. Barley and turnips were the seeds employed, and the introduction of the poisonous substances seemed rather favorable than otherwise as to the quantity of crop obtained. But neither of the agents tried was absorbed under these circumstances, and the question was whether the quantities employed were sufficient. A larger dose of arsenic he found killed the plants, and he proposed trying the effect of larger doses of the salts of barium and strontia.

SUGAR IN THE URINE OF A FOX.

It is generally said that the amylaceous and allied matters give rise to the production of sugar in diabetes, and in the treatment of this disease they are ordered to be abstained from, yet Dr. Vinheschgan has detected small quantities of sugar in the urine of a fox; a purely carnivorous animal.

MOVEMENTS OF THE HEART.

MM. Chaveau and Marcy have applied a self-registering instrument to record the movements of the human heart, and they inform us that the systole of the auricle begins and ends before that of the ventricle, and that the systole of the ventricle and the beating of the heart begin and terminate simultaneously. They therefore conclude that the beating of the heart is not the result of the auricular systole, but of the systole of the ventricle.

DETERIORATION OF GINGER.

At a late meeting of the *Entomological Society* Mr. White called attention to the injury sustained by ginger-root, brought to this country from the East Indies, by the larva of a small beetle, apparently the *Lasioderma testaceum* of Stephens. The depreciation in value of the ginger imported from Cochin and Calicut is estimated at upwards of £3000 annually. Mr. White observed, that this insect was first noticed in this country in 1835, and since that time it has become a common species in houses, not only in this country, but on the Continent. We think it was about this time that we perceived some samples of the rhizome in our possession to be affected by this parasite, which was then altogether new to us.

COPPER-SMOKE DISEASES.

To obviate the injurious consequences known to result from the disengagement of arsenical and sulphurous fumes during the smelting of copper, a patent has lately been taken

out to effect their condensation, instead of allowing them to escape into the atmosphere, by which it becomes empoisoned, and its injurious effects seen in the peculiar disease affecting the osseous tissue of animals, and the desolate appearance around the works through the destruction of vegetation.

In connexion with this subject, Dr. Olding, referring to the conditional state of arsenic in vegetables, states that a year or two since he was called upon to examine into the cause of death of some cattle at Swansea, which he found to be arsenic, the soil where they were fed being rich in this mineral. The grass was also found by him to contain arsenic, but in the turnips grown in the same soil he could not detect the presence of any, although the soil contained several grains of arsenic in the pound. In this he grew some radishes, but could find none of the poison in them. He adds, that the arsenic was in a very insoluble state in the soil, rendered so, in all probability, from the large quantity of iron existing in it.

NASCENT OXYGEN A TEST FOR ANILINE.

Some instances have recently occurred of nitro-benzole, now very generally employed, being the cause of death, and Dr. Letheby has found that in the body it becomes changed into aniline. A very delicate test for this latter, he states in the *Chemical News*, to be nascent oxygen, and the best means of applying it is by the agency of the galvanic battery. If a drop or even half a drop of a solution of 1 part aniline in 1000 of dilute sulphuric acid be placed on a clean piece of platinum, and touched with the negative pole of the galvanic battery, while the positive pole is in contact with the platinum, the liquid acquires a bluish, then a violet, and finally a pink colour. The colours are heightened in intensity by concentration.

Strychnia comports itself in a similar way, but the doctor says, "the two alkaloids are distinguished, not merely by the volatility of aniline, and its appearing in a medico-legal inquiry in the distillate from the suspected matters, but also by the circumstance that while strychnia requires the concentrated acid to show its violet colouration on platinum, aniline is best seen with the dilute acid."

Other sources of nascent oxygen may be resorted to, but this is the most sensitive and most manageable.

THE VETERINARIAN, MARCH 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

THE RELATION OF PRACTICAL MEDICINE TO PHILOSOPHICAL METHOD AND POPULAR OPINION.

In a former number we reviewed a pamphlet under the above title by Dr. Russell Reynolds.* As many of the divisions were left by us unnoticed, and we promised to resume its consideration; we do so now. It might have been thought that much which we then extracted was penned by the writer in a censorious spirit, but we would rather consider it as an earnest contention for truth. It will be remembered that the object of the author was to show the relation occupied by medical science to general philosophical method on the one hand, and to popular opinion on the other, explaining the causes which operate in producing an advancement or a retrogression of the medical profession at the present day.

As much advanced by him bears on our division of medicine, at least relatively, we have thought some degree of profit might result from a resumption of the subject, placing it under another division rather than that of a "review."

We are somewhat inclined to concur with the position laid down, although we are quite aware that many will not agree with us, and we know the risk we run from the long-maintained and acted-upon opinion to the contrary, namely, that the student of medicine generally devotes too much time to the study of anatomy, to the exclusion of other divisions of science. We are ready to concede that this is the foundation of his studies, and that it should be well and carefully laid; but if nearly all his time is to be occupied by laying the foundation, when will the superstructure be raised? To each section should be carefully allotted a portion of his time, as regulated by his teachers, and then will the whole

* *Veterinarian*, vol. xxxii, p. 162.

become perfected, every division supporting and strengthening the other. The like objection has been taken to the prominence given to morbid anatomy. The study of this, however, seems to be of even greater moment, but of course diseased structure, or an altered condition of a part, cannot be understood without a previous acquaintance with healthy structures, and the normal state of the organs.

"A knowledge of structural changes is of very high importance, but it is not of exclusive value. Acquaintance with the nature of organic lesions, their causes, natural history, sequence, and results, is of real assistance in practical medicine only when combined with etiology from the other side, a knowledge of symptoms and of general dynamic changes. But now we often see men who can discuss the quality of myeloid tumours, and talk very learnedly upon cells, nuclei, and degenerations, upon what is carcinoma, and upon what is not; and yet whose opinion of a case during life would be of value in inverse proportion to the accuracy of their microscopical delineations. In practical medicine what errors have we not seen from an exclusive attention to bruits, rhonchi, percussion notes, and the like, when these have been set up in value above the general, vital phenomena, whose perception and valuation is not quite so readily attained."

So with therapeutics, or that division which treats of the application of medicines to disease, how much there is still to be ascertained under this head! Science has unquestionably of late years done much to explain the *modus operandi* of medicinal substances, yet here we find the opposite extremes to be advocated. Some practitioners direct the employment of large quantities of certain drugs, while others recommend infinitesimal doses; and again there are some who have the temerity to assert that none is called for; all we have to do is to leave nature to her own resources, a *placebo* being all that is required. Such verify Ben Jonson's definition of physic:—the art of amusing the patient while nature cures the disease. But this is not enough. From causes brought into operation, the harp of many strings becomes untuned, and functional derangement is set up, which if not restored leads to organic change. To prevent this the judicious employment of remedies, the action of which is known, is called for. All this doubtlessly arises from the operation of medicines not having being correctly ascertained; no rigid examination as to their effects on the organism being entered upon; hence the discrepancies. But surely no one will be bold enough to gainsay the importance of the inquiry, for however skilful a practi-

tioner may be in diagnosing disease, unless he be conversant with the means for its eradication, or rather, how to assist nature's efforts to do so, he must fail in effecting a cure, or alleviating suffering.

In one thing doubtless there has been an advance, namely, a growing disbelief in specifics; *i. e.*, in the power of a given drug to expel a given disease.

"The idea of specifics had its origin in some metaphysical notion of disease as an entity in the organism, which entity was cast out by another entity, somewhat stronger coming in; and this notion is dying out of the professional mind. We now regard disease as a condition of the organism, which has to be changed; and whilst the number of even so-called specifics is daily decreasing, an increased knowledge of the early conditions of disease is displaying the fact that by judicious measures, medicinal and others, those conditions may be changed or their results obviated. Bad health is not regarded as an entity to be removed, but a state to be improved by physical education. Disease is not a demon to be exorcised, but a bad habit to be reformed."

The changes proposed by Dr. Reynolds, so that the science of medicine may not only maintain its status, but continue to progress, are as follow, and in them we think we perceive much that is suggestive to ourselves.

"Instead of wasting two or three years in compounding pills and draughts, and occasionally seeing practice which he cannot understand, the student, before he enters upon his curriculum of college or hospital work, should be well grounded in physics, chemistry, and botany, and not be bothered (as he often is during this period even), with the 'bones.' He should bestow comparatively much less of his time upon anatomy, and much more upon physiology. Lecturers on medicine and surgery should not waste their time on pathological anatomy; but leave that to its proper teacher, and thus gain more time for instruction in symptoms and vital characteristics of disease. The spirit of investigation should be evoked rather than details crammed down, and the action of medicines should be made a special object of clinical study.

"By such means we should gain the advantages derivable from the prevalent philosophical system of the day, and should at the same time avoid its injurious results. Practical medicine would then advance, instead of becoming, as it now appears in danger of becoming, a cumbrous mass of unwieldy diagnostic and prognostic machinery, with the daily increasing conviction that therapeutically considered, it is of little use."

It has been well said that the true student of the noble art of healing now-a-days is a modest and a watchful man. Conscious of the importance and dignity of his calling, he does not compromise it by pretensions that are extravagant. He waits upon Nature in the only spirit which wins anything from her, and, confessing himself her servant, he goes the right way to become her master. A noble field is

before us in the acquirement of a knowledge of therapeutics, with no fear of the following scene being re-enacted; although we energetically denounce an approach even to the semblance of cruelty, or the giving of unnecessary pain, in the experiments instituted.

Erasmus once lay in a roadside alehouse, sick of a malady which was little understood. The pundits of the spatula and lancet gathered about the bed of the unknown patient, and wrangled in pompous Latin over the method of cure to be adopted. Presently a novel and desperate course was propounded, and agreed upon. "*Experimentum fiat in vili corpore,*" cried the chorus of Galens; "let us, by all means, try the thing upon this fellow's carcase." The best Latin scholar of his age, however, had listened to the conversation, and rapped out a Roman phrase of dissent which scattered his physicians.

We would not be thought to imply by these observations that nothing has as yet been done. Were we to, we should give the lie to our own pages. But while much has been done, much still remains to be done. We should be conversant with the effects produced by certain agents, both in sickness and in health, as the former oft modifies, if it does not determine their action. Our Materia Medica is not large, nor need it be; nevertheless the missiles to combat with the enemy should be well chosen, and have stood the test, or the victory may be lost.

"In regard of popular feeling," says Dr. Reynolds, "the community may be divided into three classes. First, there are those who believe in the orthodox practitioners, who call things by old names, believe in fever, inflammation, boils, gout, consumption and other maladies; respect fervently leeches, blisters, black draughts, blue pill, and colocynth; send for their doctors as soon as they are ill, do just exactly as they are bid, inquire simply whether the liver is affected or the head, and are satisfied with what they term his 'pronouncings.'

"Then there is another class, the sceptics and eclectics; people who believe that medicine is all a sham, and who never send for advice until they are frightened, because very bad. Sometimes they follow the advice that is given; but more often they do just the opposite. They treat the science as a farce altogether, speaking of it as uncertain and useless, and yet are so constantly wandering from one to another of its practitioners that they get no good at all; and while philosophically asserting that the art can do nothing, and that Nature must do everything by her own inflexible laws, and irresistible operations, they yet growl at the practitioner for not accomplishing more than their own statements allow to be possible.

"This class is a large one, but not so large as the third, which consists of the extremely credulous, these latter being frequently a compound of

scepticism and credulity. The great desire of the third class is something new, something they can talk largely about and 'do a little bit of' themselves; and there is always plenty of novelty for their amusement or their injury. These people are eccentric, and often pride themselves in 'free thinking' and in knowing a little—I beg their pardon—a great deal of physiology and pathology. They have generally got hold of some 'wonderful man,' who knows everything; and they regard the orthodox practitioners as bigoted old men, who know less than themselves.

"These patients know what symptoms to have, and generally have them, and if you do not cure them immediately they go to some one else, who cured their first cousin of a similar attack; they know it was precisely similar, and what was done in his case was so-and-so. They always ask what you are going to give them, because generally they cannot bear the slightest grain of some half dozen most ordinary drugs. They are always taking medicine, and recommending others to do the same. They travel to Germany to drink the waters there; go to Harrogate, and rejoice in the odour of antiquated eggs. They try globules for a time, and carry about them most tempting little cases of bottles, from which they regale themselves with grain doses of differently named samples of sugar of milk, and all this in accordance with their little books. Hydropathy, compressed air baths, quack medicines, revalenta arabica, galvanism, mesmerism, spirit-rapping, and the like, are all tried, and one and another for the time extolled; then they go their backsliding ways to 'antibilious pills;' have a fit of claret; then an attack of 'old dry Lisbon;' become teetotallers, vegetarians, great walkers, and carry pedometers; wear ventilating hats, try brandy and salt, and give up coffee, find out 'it's all the stomach,' and take pepsine; break their legs, and go to a 'bone-setter' to have them mended. They wish they had been doctors themselves; they think their own case the most extraordinary upon earth; they believe to the full in physic of all kinds, but they as potently believe that no one understands it but themselves; and when they are about to die, they always think that it is because they did not do something else, or 'drink some waters' for a month longer three years ago.

"Thus there are—1st, The old orthodox believers in institutions, and the ways of their grandfathers; 2nd, the believers in themselves, in the next generation, in novelty, or at all events disbelievers in the old; and 3rd, a certain middle class of sceptics, eclectics, and the like, often very foolish in their conduct, although priding themselves upon superior judgment. And it is owing to the numerical and social predominance of one or the other of these three classes that the regular orthodox profession has its position of affluence, respect, or ignoring; but the distribution of these classes, and the influences they exert, are in great measure due to the bearing of the profession itself."

Dr. Reynolds, having adverted to medical literature, and the causes that militate against scientific progress, closes his essay with the following remarks—a panegyric on medicine not greater than it merits.

"The real advance of practical medicine is not determined solely by the position it takes among the sciences, or by the success which attends its therapeutic efforts, but by the elevation of its moral and social character, and to this real advance all may, in their proper sphere, contribute. There is scarcely any imaginable limit to the influence for good which our profession may exert. To it are entrusted all the capacities for suffering or for pleasure with which our mysterious organisms are endowed; life, with all its manifold changes, its bodily infirmities, its subtleties of mind, is com-

mitted to its care. The realization of long-deferred hopes, the blighting of fairest prospects; the weakness of the once strong man; the almost fiendish strength of the bodily-enfeebled maniac; the victory over agonizing pain; the humiliation of loathsome malady; the joy of returning health; the crushing grief of irresistible disease; birth, with its labour and sorrow; and death, with its repose—are among its familiar scenes. We are daily and hourly placed on the threshold of life—on the border-land between the seen and unseen. We have constantly before us the great unravelled problem of humanity. Vague sounds float out to us from those around whom disease has thrown the mysterious veil of so-called 'unconsciousness.' We hear them 'wandering' in the darkness our human knowledge strives to penetrate in vain; we feel that it may be light. What questions are we not asked by those who stand around, eager to know what relation those objects of solicitude, and of long years of love, yet bear to them! There lies the vesture of mortality, scarcely rustling with the breath of life. Can it again be placed on common terms with us? Are there any ties yet left unsevered? Or is it, even now, the cast-off garment, fitted only for decay? We stand appalled before the great facts we can neither doubt nor explain. We are conscious of our two-fold being. We can recognise its intense reality in the consciousness of others. We are regarded as the interpreters of that awful hour; but how to interpret all these circumstances is not taught us in pathological treatises; how to act under them finds no place in our systematic therapeutics. We have to learn it by the study of ourselves and others, and by the experience which time alone can give.

"But 'thanks to the human heart, by which we live,' thanks to its nobler nature, its common sympathies, 'its tenderness, its hopes, and fears,' the suffering man has always found in the medical profession the succour and support he needs; and if, year after year, the scientific advances which are accomplished are not such as to satisfy the ambitious inquirer after truth, yet the sorrows of humanity are hourly soothed, and the load of life is lessened by the unselfish care and kindly offices of that profession, whose mission—to use the words of one of its great masters, but recently passed away—is to 'cure the curable and comfort the incurable;' and in whose ranks it is our common honour and privilege to take our stand."

We confess to have read the *brochure* with pleasure. We like the bold and independent spirit in which it is written; but we need hardly say that it is only by comparison, and from the relative position in which the two divisions of medicine—the human and the veterinary—stand to each other, that we can hope to derive any benefit from it. Science, however, be it what section it may, courts investigation, and loves not exclusiveness, but, like charity, seeks another's good, and to its votaries says—

> "That which before us lies in daily life,
> Is the prime wisdom: What more, is fume,
> Or emptiness, or fond impertinence."

ADDRESS OF CONDOLENCE TO HER MAJESTY.

Subjoined is a copy of the Address of Condolence to Her Majesty, presented by the Council of the Royal College of

Veterinary Surgeons, on the irreparable loss which she, the Royal Family, and the Nation, have sustained by the death of the late Prince Consort. His was a life devoted to life's duties.

Most fervently do we hope that all consolation may be accorded to Her Majesty in her bereavement, and sincerely do we join in the expressions of regret so universally felt, believing that not only has Science, with the Fine Arts, lost a judicious patron, but the utilities of life a warm advocate and influential supporter.

"To the Queen's Most Excellent Majesty.

"May it please your Majesty,

"We, the President, Vice-presidents, and Council of the Royal College of Veterinary Surgeons, actuated by the feelings which now move the hearts of your Majesty's subjects, desire humbly to approach your Royal presence with sentiments of the most reverent affection and heartfelt sympathy with your Majesty, on the melancholy occasion of the decease of his Royal Highness the Prince Consort.

"Never has a bereavement struck so deeply into the hearts of a sorrowing people.

"In the sacred relations of domestic life, by his distinguished abilities, earnest devotion, and untiring zeal for the national welfare, the late illustrious Prince commanded the admiration and won the esteem of all classes of your Majesty's subjects.

"We cannot too fully appreciate the vast benefits which have resulted from the great interest ever taken by the late lamented Prince in the progress of Medical improvement in all its branches, and from the great encouragement afforded by him to the various schools of science, literature, and art.

"That the God of all consolation may comfort, support, and bless your Majesty; and that you may long continue to reign over a faithful and devoted people, is the earnest prayer of your Majesty's most loyal and obedient subjects.

"By order of the Council given under our common seal, this 31st day of January, 1862, in the presence of

"F. R. Silvester, *President.*"

REPORT OF THE GOVERNORS OF THE ROYAL VETERINARY COLLEGE TO THE COUNCIL OF THE ROYAL AGRICULTURAL SOCIETY, FOR THE YEAR 1861.

The Governors of the Royal Veterinary College beg to lay before the Council of the Royal Agricultural Society their Report for the past year. In doing this, they feel it altogether unnecessary that they should expatiate at any length upon the advantages derived from the united action of the two institutions, which has now existed for so many years. They desire, however, to direct the attention of the Council to the educational advantages which the College, under the agreement between the two institutions, affords.

No more efficient means for permanently improving the practice of the Veterinary Art in its application to domesticated animals, other than the horse, can be provided that the inculcation of the principles of medical science in the minds of the rising members of the profession. Hence, the governors have been careful to ensure the continuance of lectures on the diseases of these animals. Throughout the past session, four lectures a week have been regularly delivered; and as each session commences in October and ends in May, no less than a hundred lectures have been given in the sessional year on this subject. In addition to the lectures, clinical instruction and demonstrations on morbid parts, which from time to time reach the College from members of the Agricultural Society and Veterinary Surgeons, have been likewise given. The receipt of specimens of disease has undergone a steady increase, so that it may be said that scarcely a week now elapses without the students acquiring a practical insight into the pathological condition of the several organs and tissues of the bodies of the animals in question. By the rules of the College, no student can avoid attendance on the instructions of the Professor of Cattle Pathology, any more than he can on those of the other professors; and it is with much satisfaction that the governors can add, on the united testimony of all the teachers, that an equal desire exists among the students to acquire information on this, as on the other divisions of Veterinary Science.

Each student, at the close of his studies, has to undergo a preliminary examination, conducted by his teachers, and to obtain a certificate, before he can present himself at the Court of Examiners of the Royal College of Veterinary Surgeons as a candidate for its diploma. At this Court an equal period of time is devoted to the examination on Cattle Pathology as on the other branches of Veterinary Science; thus a correct and efficient test of the education of the

student is secured. On looking back to the period when the education of the pupils was extended so as to embrace the maladies of all the animals of the farm, now about twenty years since, the governors find that no less than 902 students have subsequently entered the College. These have all received instruction on Cattle Pathology, and although some have not passed their examination, and entered on the legitimate practice of the profession as veterinary surgeons, 638 of this number have passed their examinations and graduated as members of the profession. In addition to the 902 former students, there are now in daily attendance at the lectures 112, who will in due course also present themselves before the Court of Examiners for the diploma of the College. These figures afford some proof of the extent to which the object, long since agreed upon by the two societies, has been, and is in course of being, effected. The country is thus regularly supplied with veterinary surgeons, whose scientific knowledge is not, as it was wont to be, restricted to the maladies of the horse. The advantages derived by the agricultural community and the public from this system of education, the governors cannot but believe to be of the greatest value.

A limited number only of diseased cattle has been received at the College for treatment from the members of the Society during the year; compared, nevertheless, with some former periods, the number has been greater. Among the cases, there are none which call for any especial mention, as being unusual or rare. They have, however, offered sufficient variety to be of great use to the pupils, by enabling their teacher to explain and compare the symptoms and the progress of the more prevalent affections with the allied diseases of the horse. If means can be adopted to increase the supply of bovine patients, the governors would be much gratified, and most willingly carry out any practical measures for the accomplishment of so desirable an object.

The governors may here allude to an experiment which has been undertaken at the request of the Royal Agricultural Society, for the purpose of testing the value of a supposed remedy for rot in sheep, which had emanated from a French veterinary surgeon. Six of the sheep, being a moiety of the number which were made the subjects of the experiment, were kept for many weeks in the infirmary, and every care bestowed upon them necessary for the attainment of a correct conclusion as to the value of the remedy. The other six sheep were taken to Mr. Simonds' farm, there to be treated under opposite circumstances of food and location. The result of the experiment may be said to be negative, in so far as establishing the value of this presumed remedy for rot, but

it has nevertheless afforded additional means of imparting information of a practical nature to the students. A full description of this experiment has been recently communicated by Professor Simonds to the Council. It is, therefore, unnecessary that the governors should recapitulate the details.

The governors have learnt with much satisfaction that the alteration which was made by the Council in the veterinary privileges of the members of the Royal Agricultural Society, a few months since, is likely to work exceedingly well for both institutions; *first,* by enabling the members to obtain the immediate services, and at a small cost, of the Professor of Cattle Pathology; and *secondly,* by furnishing him with illustrations of disease for subsequent use in the lecture room. Professor Simonds has already made several visits into the country, and, during not a few of these, by investigating the causes of the disease on the spot, has succeeded in arresting its progress. Many isolated cases of disease have also been successfully treated. These circumstances convey an assurance to the governors that great and lasting benefits will arise from the course, in this respect, which has been recommended by the Council, and to which the governors have had much pleasure in giving effect.

Under this head, the governors cannot refrain from alluding to the attendance of Professor Spooner, jointly with Professor Simonds, as the Society's Veterinary Inspectors at the Leeds Meeting. The benefit of these inspections, in keeping in check the proceedings of some exhibitors who have substituted animals of greater age than set forth in their certificates, and also in preventing the spread of hereditary diseases among our best and most valuable breeds of horses and cattle, can scarcely be over-estimated. Most willingly have the governors, through their officers, lent their co-operation in support of the Society's laudable object, and they trust to have the satisfaction of being informed that the professors will be similarly engaged at the approaching International Meeting in the metropolis. The privilege of allowing two of the students of the College to attend each inspector, and to render him assistance in the performance of his duties, is one also which the governors highly estimate, since it tends directly to promote a spirit of laudable emulation among the students.

Many kindred subjects might be alluded to, and much added to this report, both in proof of the advantages derived from the united action of the Royal Veterinary College and Royal Agricultural Society, in extending the application of the veterinary art to the every-day requirements of the prac-

tical agriculturist. The governors will, however, conclude this Report by congratulating the Council of the Royal Agricultural Society upon the assurances which they have received from eminent veterinary surgeons in the country, and from other persons well qualified to form an opinion, that the ignorant and often highly-mischievous use of medicine, and the unskilful and often cruel misuse of surgery among domesticated animals generally, have greatly receded before the extension of truly scientific knowledge which the two institutions continue, by their co-operation, to diffuse.

C. N. Newdegate,
Chairman.

Extracts from British and Foreign Journals.

AUSTRALIAN REPORT ON PLEURO-PNEUMONIA IN CATTLE.

After holding various consultations and comparing notes, the Pleuro-Pneumonia Commissioners for Victoria, with the sanction of the former honorary commissioners, assisted by Mr. Meston, a gentleman of considerable experience from New South Wales, and others, have agreed to recommend for publication the following observations on this insidious malady, for the better information of stock-owners particularly, and the inhabitants of the Australias generally, unto most of whom, pleuro-pneumonia seems a mysterious visitation.

To every colonist this subject ought to be considered as involving interests of deep importance, affecting the future supply and price of meat, and the common prosperity of all the Australian colonies.

Robert Meston.
John Miscamble, M.R.C.V.S.
Anthony A. Smith, M.R.C.V.S.
John P. Vincent, M.R.C.V.S.
Alex. Brock, J.P., Hon Com.
William Lyall, late Hon. Com.

Melbourne; *Oct.* 12*th*, 1861.

The origins of new diseases are often more inscrutable than their natures.

As to this disease, Professor Simonds says it is a misnomer, and the erroneous designation has done not a little to mystify the subject. The name of a disease should always correspond with its nature. Pleuro-pneumonia signifies not only inflammation of the pleuræ, but substance of the lungs also.

The disease itself, in its first stage, is not of an inflammatory character, whatever it may resolve into afterwards.

Zymotic is a term applied to diseases caused by the introduction of minute foreign matter into living bodies, thus producing very formidable effects, and may be inducted by inoculation (as the smallpox), or by natural causes through means of the lungs, the skin, or the blood. Pneumonia, therefore, is considered to rank under that category, is local and specific, and subject to similar laws as other zymotic maladies. We are aware that the presence of such a disease is denied by various members of the community, who very likely, on a cloudy day, would also deny that the sun was in the firmament because they could not see that luminary. But in face of so much testimony, it is waste of words to attempt farther proof, because facts do not require them. It is useless to attempt convincing ignorance; whether learned or unlearned, both are equally obstinate to be convinced or converted.

Nature of the disease.—We have strong evidence, says the learned professor already quoted, that pleuro-pneumonia is highly contagious; and, unhappily for the country, this fact has entirely been lost sight of. The disease is an epizootic, and was first introduced into Britain a little before the alteration of the tariff in 1842. It was then a new disease there, but not new in foreign countries.

The history is obscure. Various authors have written on this subject. Silius Italicus describes one similar to the existing malady, with great accuracy, as appearing 212 years B.C. In France an epizootic pneumonia prevailed in one of its departments, through droved cattle, and spread over a wide extent of country; indeed, soon after it extended over the greater part of Europe, and manifested itself suddenly in Holland. In two years, the Dutch lost 28,000 cattle. It is now ascertained that pneumonia raged at different periods over Asia, Africa and Europe; now America and Australia begin to suffer by its pestilential introduction.

The modern progress in Britain is well ascertained. It was brought from Holstein by some cattle imported into the north of Scotland—as if the farmers in that country did not possess better breeds of their own; and the disease spread with amazing rapidity by means of cattle driven from north to the southern markets; not one in a hundred recovered, and skill was tried in vain. The "terms of contagion and infection," says an eminent author, "we shall not scrupulously endeavour to discriminate. In strictness, contagion is applicable to communication by contact." Without discussing the ingenious arguments by which some writers have

plausibly supported the non-contagion theory, we are ready to maintain that pleuro-pneumonia is an infecto-contagious disease. In typhus fever, and some others, certain poisonous effluvia issue from diseased bodies, and are diffused through the air, rendering susceptible animals liable to inoculation by the virus. Such effluvia attach themselves to clothes, hair, fur, wool, cotton, or the mucous membranes of animals, and so communicate the contagion or infection to indeterminate distances. The poisonous fomites appear to be not widely diffused through the air, but seem to surround certain nuclei, the moving modus of spreading this contagion. That the dispersion of diseases by contagion or infection is often dependent on peculiar conditions of the atmosphere, no one can doubt; *plus* or *minus* indications of the earth's electricity, or of the air, in cholera have been found to produce great influences by increasing or retarding the intensity of that dreadful malady. That the whole series of phenomena result from the influences of morbific poisons on, or in the body, few physiologists can doubt. But whence this or these invisible active agents? The mud of old Nilus may originate plague, and festering flats of the Ganges generate cholera. Yellow fever spreads in the West Indies, and intermittents annually occur in the marshes of the Maremma; but the fomitic virus, who can describe? All we know is thus far:—A definite train of consequences follows the insertion; and it appears that this secret power often is an agent, *sui generis*, producing disease of a definite nature and attacking only particular species, and particular organs. Doubtless, the famous Board of Health, in their report, shook the belief of many regarding infection and contagion, but until clearer facts are propounded it will be as safe to imagine that such means of disseminating, or spreading far and wide, do indeed exist, and let us guard against the serious effects. There is more material matter floating through the air than most people can conceive—light seeds of various kinds, impalpable solid matter in a minute, pulverised state, germs of smut, blight, and, perhaps, of animal diseases. "The nebulous dust, or sand," says Ehrenberg, "which mariners encounter in the vicinity of Cape De Verd Islands, 360 miles from the African shore, contains the remains of eighteen species of siliceous shelled polygastric animalcula." Men have become rabid from moisture off the tongue of a mad dog, and carried into their system by the absorbents, without any bite or abrasion in the flesh or skin whatever.

Seat of the disease.—The prime seats of the disease are either in the lungs or in its near neighbour the pleura. So delicate organs as the lungs may be supposed liable to numerous dis-

eases. Pleurisy, asthma, consumption, hæmoptysis, tubercles, pneumonia, sporadic or malignantly epidemic, rank on the lists. Tubercular formations are extensively found in Victorian cattle, and are common enough in many of the New South Wales districts. These previous formations would doubtless accelerate the finale of pneumonia. Irritations of texture cause inflammations; serous membranes, like the pleura, produce adhesive lymph; this brings on congestions in the lungs; congestions preclude access of fresh air, and animals die of asphyxia. One of the most adverse conditions of this disease is the extreme debility which very soon is observable. So sudden a prostration of strength renders prescriptions of medicines exceedingly uncertain, and the quadruple stomachs of cattle make their effective administrations very doubtful, and the drugs too often inoperative until too late.

This pleura (commonly called skirts) is a serous membrane, which envelopes the lungs, and lines the cavities of the chest.

The pleura costalis, or rib lining, is a fine sheet of elastic cellular tissue, attached to the sides. The pleura pulmonalis is placed on the exterior of the lobes of the lungs, and is believed to afford important aids to expiration.

These two portions are continuous, and have a sac into which a small quantity of serous fluid is constantly secreted, which moistens the opposite superficies of the lungs, and at every expansion by inspiration of air causes them to play easily on one another; meaning the lungs, on the smooth pleuritic membranes. And it is here worthy of notice, that this pleura, and the peritoneum or enveloping membrane of the intestines and abdominal cavity, are both serous; and that whereas the first is ultimately severely inflamed in pleuro-pneumonia, so also is the other in Cumberland enteritis, thus showing their susceptibility to inflammatory diathesis.

Inflammation of the pleura is always accompanied by extravasations on its internal surface, being coagulating lymph or serous purulency.

This matter is partly absorbed, leaving often a dangerous coating. In course of time, adhesions ensue, and lung and pleura become united—a condition very common in the human subject. Whatever the causes, serous membranes seem very prone to inflammation, even more than the mucous.

Pleuro-pneumonia is both infectious and contagious at certain periods and seasons. It may for a time assume a chronic type, and again burst forth with all the virulence of a plague. Certain states of the atmosphere which call into

action lurking fomitic pestilence, or retard its progress, together with predispositions or repulsions in the animal functions to receive or resist these very potent rudiments of disease, often puzzle and perplex, whether in this or in some other maladies, by seeming capriciousness. The disease is communicated by vitiated saliva of the mouth; by gangrenous matter proceeding from ruptured abscesses of the lungs; by gaseous expirations from diseased air-cells, and inhaled by healthy animals; or by poisonous effluvia issuing from bodies labouring under fatal morbific disorders and diffused through the air, fixing on hair, fur, cotton, woollen, grass, hay, straw, or mucous membranes of living creatures, as already stated. In proof of the contagious character of this disease, we have the highest authority in Britain, that of Professor Simonds. We have also the evidence of a joint committee from both Houses of Legislature in the state of Massachusetts, which, after sitting eight days, and instituting a rigorous inquiry, made the following report:—"That the disease was highly contagious, and so insidious in its attacks, and so fatal in its termination, as to warrant the most stringent measures for arresting the progress and protecting the great interests exposed to its ravages." Their opinion was freely expressed, that many animals carry about with them the seeds of latent disease, which only await conspiring circumstances and conditions for arousing them into fatal activity. A six months' *lapsus* is believed not to be infrequent; but how much longer is a term wholly apocryphal. Let the elementary virus be what it may, when it enters into the system, it then concentrates itself in some particular organ more susceptible of its action than any other, just as parasitic fungi or entozoa will only attach themselves to particular plants, or be found on or in definite parts of the animal system. The disease, therefore, follows the laws of other zymotics, acting from time to time with destructive effect when the intensity of its powers is in action, and then intermitting, mitigating, or apparently disappearing without any apparent indications that the exciting causes had been sensibly changed. We care not whether the disease is communicative by morbific germs or mephitic exhalations, or whether chemical affinities and chemical action are or are not the primary or secondary causes. Men must be equally on their guard, in order if possible to avoid the fatal consequences.

The first introduction of this malady into the Australias is believed to have been through means of a high bred cow, imported from Britain into Victoria. Notwithstanding ordinary precautions to destroy all contaminated cattle, the

subtle germs were not extinguished also. The disease continued to spread, for little exertions were ever made by legislature and settlers to arrest its progress. A bill was passed through the Victorian Assembly, on the 19th of March, 1861, to prevent the further spread of this epidemic, which, however, had reached the Ovens, near the border of New South Wales, by about the month of April following. A bill was speedily introduced into the Sydney Legislative Assembly, passed in one week, and approved of by the Upper House, without any alteration, "for the purpose of regulating the importation of cattle, and preventing the introduction of contagious or infectious disorders, or propagation thereof in that colony. April 11, 1861." The act may appear stringent, and powers in it conferred on the Executive may seem too ample; but the circumstances require vigorous measures, which, through laxity, have been unsuccessful in Victoria. We stand not alone in exclusion, *pro tem.*, of all importations of the bovine family, to shut out disease. Norway had taken a like course, and many other countries have followed the examples.

Symptoms.—When any animal, whether of the sheep or ox species, falls behind its companions, mark it; if the head hangs, the breath is hot, a very hard short cough sets in, there may be a little lameness, appetite is gone, anon there is a tenderness exhibited about the spine and lumbar region, flanks heaving, a pain apparently in the shoulders, there is a peculiar grinding of the teeth, and cough becomes more frequent, matter is thrown up by a kind of spasm—be certain that pneumonia is commencing its deadly operation. The particular diagnosis may be shortly stated:—Twitchings along the sides; the sick animal usually lies, if it lies down at all, upon the diseased side, and when standing stretches out the neck and protrudes the head, at every expiration a deep groan is uttered, indicating extreme pain. The auscultatory indications are crepitous murmurs during respiration in the first instance, but when the disease advances that crepitus ceases. We have here to remark, that the disease runs through three stages—first, the initiative; secondly, the inflammatory; and thirdly, the typhoid. When lymph is effused, and a part of the lungs gets hepatized, then the disease assumes a serious stage, breathing is continued with great difficulty, and if disorganization of the lung is not extensive an adventitious membrane is formed, separating the diseased part from healthy portions, and partial recovery is not infrequent for a season.

But when inflammation of the pleura runs high, the con-

sequence is effusion of serous matter, and the animal dies of hydrothorax.

The lapse of time during which pleuro-pneumonia may remain latent in the system is unascertained. Numerous statements have been made regarding the periods of incubation. Fifty cases have been recorded, by which it appears that from the fifteenth to the twentieth day four fifths of the animals fall sick, and nine tenths before or on the sixtieth day. In two cases, six days only elapsed, but all these must depend on the stamina and condition of the animal, or causes enumerated elsewhere.

Treatment.—This head will be considered by some as entirely unnecessary. We have heard of many pretended cures, but all have failed when put to the test by competent men. Pleuro-pneumonia is an eminently fatal disease, and rarely an instance can be quoted of complete recovery at its first outbreak, when its intensity is supposed to be greatest. Cattle die from various other maladies, and ignorance, nay, sometimes experience, is non-plussed to distinguish. Complications are often met with. Disease may be for a time arrested, but disorganizations of the lungs are never repaired. Both in cattle and in men, nature is unable to remove the deposits caused by this disease, and to substitute sound tissue in place of that destroyed; and the more we know of it the more positive we become that all cures are perfectly inoperative with the object of absolutely removing disease from the system; yet veterinary science is not altogether without power to arrest its activity and extend the life *pro tem.* of many animals.

Precautionary and preventive measures.—Segregation has, in many cases, been recommended. Contact must be avoided. Remove wide apart all cattle ascertained to be free of pneumonia, and slaughter every apparently diseased beast, or those under the slightest suspicion of labouring under the epidemic. Let all the carcases be immediately burnt, lest birds of the air convey portions to remote parts of the country, or the dogs, or perhaps dingoes, carry it to distant stations. All the clothes of men who have been handling contaminated carcases are to be washed and boiled, or changed, ere the owners can be allowed to come into healthy townships or habitations, or upon runs believed to be in a sanitary condition. Our best sheet-anchor is prevention. The time now is approaching when men must act vigorously, or else lose their cattle—if they wish to save the country, *unite.*

"The summer returns,
And the fever burns."

1. Duly qualified commissioners should be appointed in order to direct constables or inspectors how properly to discharge their duties. 2. The said commissioners should be empowered to enter amongst all herds of cattle which may or may not be smitten with pleuro-pneumonia; and if any exhibit symptoms of said disease, they should have power to cause such animals immediately to be destroyed, or such measures to be taken as hereafter provided. 3. In order to avoid the possibility of contagion extending itself, it will be the duty of every colonist to give all information and assistance to the commissioners in order that they may take the necessary steps where required. 4. The commissioners may declare any run or district unclean, and have the powers to proclaim a sanitary boundary, which they may again remove from time to time, should the malady unfortunately make progress. 5. Should the epidemic prevail to a wide extent, a general assessment should be levied on colonial cattle, in order to compensate stock-owners who had the misfortune to have their cattle diseased and destroyed. 6. The executive should be requested to advance limited sums on the recommendation of the commissioners, until an Assessment Act is passed in parliament, when reimbursements will be made from the proceeds. 7. All dead bodies should be burnt or buried by the late owners, if known, or by the orders of commissioners and inspectors. 8. All straying cattle are to be looked on with great suspicion, and, perhaps, for better security, may be shot down, and all travelling bullock-teams from suspected places should be stopped. 9. It should be penal for settlers who have had the disease on their stations to remove any cattle therefrom until after —— months, or after a qualified person has declared the cattle and the run to be clean. 10. Let all travelling cattle be strictly examined, as those are more liable than beasts locally bred, to receive the rudiments of any disease, on account of the lassitude attendant upon travelling. It has been so found in Scotland, Ireland, France, and Germany. 11. Should the malady break out with intensity, a result to be anticipated, it would be beneficial for those having cattle in good condition to erect Bouilliant establishments, which establishments are to be publicly notified, so that they may be avoided by all healthy stock. 12. In order to get rid of the vexations attendant on appraising stock, a fixed rate for all sexes and ages should be at once determined. By this method, number alone would be wanted for certification, and a fair remuneration would, in most cases, be awarded to the sufferers; but the rate should rule in such a way as would prevent impositions, and serve to stimulate the exertions of stock-owners in

order to adopt every means in their power to avoid the introduction of this malady upon their stations. 13. Stock-owners ought to form themselves into local committees in order to aid and assist the commissioners. 14. All cattle removed from suspected herds, or where the disease at any time prevailed, should be branded on the horn or rump with some determinate mark, so as to be again known as doubtfnl animals.

The Massachusetts commissioners, at the commencement of their pleuro-pneumonian experience, destroyed 842 cattle. The practice was, that whenever herds were found diseased in part, the whole were killed, and passed to the credit of the owners. The average value ruled about thirty-three dollars, paid out of the public purse.

As in scab, the sooner stock-owners get their runs clear of pleuro-pneumonia so much the better for them; but it is not a work for one, or two, or twenty, it must be a pull altogether, else we labour in vain.

Taking into our consideration the Australian colonies as a whole, only those acquainted with their topography, soil, climate, and mode of depasturing stock can fully comprehend the danger to which an important interest is liable by the visitation of such a malady as this pleuro-pueumonia.

The manner in which cattle rove from camp to camp, and straggle from station to station, renders the spreading of this malady more than commonly dispersive. Then, it is not easy, it is impossible, to ascertain how many driven from the northward to Victoria endeavour to return, but that many do return is only too certain. The peril is, therefore, the more imminent to the northern and western colonies, more especially when we take into consideration the latent nature, through unascertained times, of this treacherous pulmonic. No methods man can devise should therefore remain untried to arrest the propagation and dispersion of so direful a pestilence, and no time is to be lost.

With regard to cattle imported from any country, the most jealous watch ought to be placed over them. These, from weary voyages, cold, privations, long confinement, and exposure, are extremely apt to develope disease (if concealed) a short time after landing. The consequences of removing animals into the interior, carrying hidden germs of disease in their organization, and finally breaking out in pneumonia, measles, or ovine smallpox, scab, or any other malady, would be ruinous to individuals—perhaps to a whole district or districts. A question naturally arises,—How long time should elapse before healthy cattle can be depastured on contaminated runs? The answer is difficult. The Scab Act specified

six months, without giving any reason for tabooing scab-infected runs for that period. Much of the disinfecting process will depend on sharp frosts or on washing rains. Could the grass and runs be completely burned over, then stock might be safely put on the first flush of the springing grass. Fire is an admirable purifier. Without such purifying agents, some time (three months, at least) should be allowed to intervene—the longer, the safer.

Post-mortem appearances.—From these, judiciously conducted, men gather the greater part of their information regarding dumb animals. The lungs are always gorged with black blood, resembling rottenness, presenting a marbled appearance. There may be an abscess, either filled with pus or cheesy-looking matter. The diaphragm, pericardium, and pleura, from contiguity, perhaps, are also black, thickened, and the latter gangrenous; and although traces of inflammation may be found in the abdominal cavity, the rumen filled with dry food, the manyplies hardened, the liver enlarged, and bile thickened, all these are consequences of the pulmonic disease; for suspension of chewing the cud, and afterwards indigestion, are certain to follow indisposition in the animal economy, of whatever name or nature the malady is recognised to be. No dependence can be placed on any autopsical report unless the operator is tolerably acquainted with pathology, physiology, and anatomy. The lungs are said to be sometimes preter-enlarged from 4 lb. or 5 lb. up to 20 lb., 30 lb., and 40 lb.

In the Cumberland endemic we learn that spleens weighing 28 lb. have been taken out, but it is quite another disease from pleuro-pneumonia. Cases occur where the lungs are comparatively free of apparent disease, so that auscultation can be no positive indication at all times. In fact, frequent dissections will show great varieties of diseased action in one, or more, or several portions in the cavity of the thorax; and, although the heart must be sympathetically affected, it is found mainly diminished in volume or size. Generally, the lungs, or parts thereof, with other organs in the thoracic cavity, are more or less the true places of pulmonary morbific action.

Referring to the opinion of Mr. Ogilvie, that pleuro-pneumonia is neither contagious nor infectious, it may be said promptly that all European and American experience rules against his ideas; and we wonder if that gentleman really understands in any degree the nature of contagion or infection when he speaks out so dogmatically. We should be strongly inclined to enunciate opposite doctrines, as the better as well as the safer conclusion. Nor is he more happy in his

allusion to the colonial monomania for numbers, without much regard to breed or quality. Why, it is thoroughly understood that, in general, all the best bred and finest cattle are chiefly subject to the attacks of this fatal malady. It is no great stretch of knowledge to tell us that it will die out, but what heaps of dead may be enumerated before disease itself dies, and what losses will be previously sustained. The Cumberland endemic is still active in some parts of New South Wales, and catarrh occasionally breaks out in others. The scourges of prickly burrs and thistles will in due course vanish from the soil; but at what amount are we to estimate the evils their presence inflicts on this or other countries while they exist?—*The 'Argus,' Melbourne, Oct. 17th*, 1861.

ON THE RELATIONS BETWEEN THE ORGANIC AND INORGANIC KINGDOMS.

The theory is gaining ground that, in both the kingdoms of nature, organic and inorganic, the forces in operation are the same. Some chemists, in fact, have ceased to draw any distinction between them. This arises from many of the organic compounds having been formed from inorganic elements; the first of these, and by which the barrier was broken down, being urea, the characteristic constituent of urine, artificially prepared by Wöhler. Then came the theory of compound radicals, by which it is almost shown that there really exists no difference. Hofman has substantiated this by his investigation of ammonia compounds. Indeed it has been said that only mischief can arise from the distinction, especially if it should be supposed that organic chemistry can be studied independently of inorganic.

In a lecture delivered during the past session at the Royal Institution, by W. S. Savory, F.R.S., he says:

Chemistry draws no line of demarcation between the organized and inorganic kingdoms. All questions of composition are of degree only, not of kind.

Life constitutes the grand distinction. The difference is infinitely greater between living and dead organic matter than between dead organic and inorganic substances. Without attempting to describe it, life may be distinguished by its effects. In life, when reduced to its simplest terms, and separated from all those elaborate details which invest it in the more complex forms, there exists a definite relation between destruction and renewal, a regulated adjustment between waste and repair whereby the condition is maintained, notwithstanding constant change.

Life is not a state of resistance. The proofs of this are clear and complete. Waste or destruction is a necessary, an inevitable condition of its

manifestation. It is involved in every vital act. And the power of compensating for this waste or change, the repair or reproduction necessary to the continuance of life, involves that of assimilation—the power of converting foreign matters into the structure of the organism: in other language, the power of appropriating food.

We cannot conceive life without including these two conditions—consumption and supply. Life is not a state of change only as opposed to stability; for this is simply a question of degree everywhere, and dependent on the conditions to which bodies are exposed. Neither dead organic nor inorganic bodies are immune from change. Nor is life peculiar as a process of repair only; for this may occur in inorganic bodies, as crystals, under favourable circumstances. But in life there is the constant and concurrent operation of these two processes, whereby it is distinguished from mere change on the one hand, and from repair on the other.

It does not appear that we can at present safely venture further than this. If we attempt to define the vital process of nutrition, distinctions fail us.

The investigation of the phenomena of life has not been in any way assisted, our knowledge of the vital processes has not been in any measure advanced, by the assumption of what has been styled a "vital principle;" —an empirical term, which, like some others when employed in physiology, is, even at the best, equivalent to nothing more than the final letters of the alphabet in an algebraical formula; for it is, when used in its least objectionable sense, a mere expression of something unknown. But the assumption of such an agent or principle, however designated, annihilating or suspending the operation of forces acting elsewhere, has not proved altogether harmless in its influence upon the progress of knowledge. By referring all vital actions to this obscure agency, while nothing was thereby explained, inquiry was to a great extent, and for a long while, checked. Many dazzled by the idea that the nature of vital phenomena was exalted by thus associating them with some mysterious and peculiar principle apart from, and opposed to those agencies which act elsewhere, missed the grander conception, that even in the vital functions may be recognised the operation of forces, some of which, at least, are common to both kingdoms of nature; while, between these and others which appear to be peculiar to living tissues, it is probable that a relation may exist like that which prevails between the chemical and physical forces.

Again, it is needful to beware how we create artificial distinctions. Is there not much assumption involved in the confession that we are unable to construct the simplest form of living tissue? Men sometimes talk as if their powers were limited only by life. But can we construct a crystal any more than a nucleated cell? We may fulfil certain conditions, under which, as we have learned from experience, crystals are formed; but what is our share in the act itself? In like manner we may take a seed or an egg, and place them under circumstances in which they will develope. In either case we are acquainted with the necessary conditions, and we fulfil them. We can do no more.

The speaker concluded with some remarks on the fact that the tendency of advancing knowledge is to efface the lines of demarcation which have been hitherto drawn between the Natural Kingdoms.

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Journal des Vétérinaires du Midi, Toulouse, Dec., 1861.

TWO CASES OF PALPITATION OF THE HEART IN THE HORSE.

By M. Boiteau, Veterinary Surgeon, &c.

Palpitation of the heart, or disease described under that name, has given rise to different opinions as to its nature. Some say that it is only a sudden contraction of the abdominal muscles; others that it is a spasmodic contraction of the diaphragm; and finally others, that it is a contraction of the heart. In the following cases, the author says, I will direct the attention of the profession to the seat and apparent cause of this malady, which has occurred simultaneously in two horses in the same stable, and which had been subjected to the same regimen, and the same kind of work.

On the 24th of March last, I was sent for by a miller to attend two horses which had been ill since the morning. The information obtained was that there was no loss of appetite, and they were as lively as usual, except that they hung down their heads a little in the morning; but this soon passed off. On the previous day, they had been a journey to another mill with a load of wheat, a distance of eight kilomètres. During their stay, which had only been for half an hour, they had eaten some bad musty hay; they had also cropped a little of the green corn which had germinated near the mill. They were in good condition, appeared lively, and were inclined to feed. In the left flank, or rather in the left hypochondriac region, was perceived a strong jerking motion, like that accompanying broken wind, but much more violent. The frame was shaken by it, and a short broken expiration took place at each of these movements. The beating of the heart could not be detected by the application of the hand to the side. Careful auscultation continued for a certain time, gave only the ordinary *bruits,* but somewhat attenuated and corresponding with the pulsation of the arteries. The respiration was regular, as in the normal state, but interrupted by the above-described movements of the flank. On examining the *ensemble* of these phenomena, we find that the respiration is

normal, the pulsations synchronous with the beating of the heart; finally, that the jerking movements of the flank are intermediate of two pulsations, but equal in number. These cases were the first of the kind that had come under the notice of the author; they somewhat puzzled him, and fixed his whole attention. At first he did not know whether it was some grave malady or only a slight affection; but ultimately he came to the conclusion that it was possibly a nervous affection of the diaphragm, caused no doubt by the musty hay they had eaten the day before. How otherwise could it be explained that these two horses should have been attacked by this strange affection both at the same time and in the same stable?

Hypothesis.—If the heart is the cause, if it be palpitation of this organ, how is it produced? It is certainly not during the systole of the ventricle, for the shock is heterochronous with the pulsations of the arteries and the *bruit* of the heart. Could it be produced by the auricular systole? In that case we must suppose an obstruction to exist which prevents the ingress of the blood into the ventricles, either by the contraction of the auriculo-ventricular openings, or some other mechanical obstruction, which would cause a reflux of the blood into the vena cava; but there would be venous pulsations. Might it not be during the diastole? This is not possible, as the whole cardial mass is then in a state of perfect quietude; moreover the imperceptibility of the pulse, the feeble beatings of the heart, the heavings of the flanks, the forcible expiration, do not indicate that the cause of this affection is in the heart. It is therefore reasonable to believe that it is a spasmodic contraction of the diaphragm, unless it can be proved to the contrary.

Treatment.—An anodyne was prescribed, with low diet and rest, which soon restored the patients to perfect health.

DROPSY OF THE AMNION IN A COW.

By M. Gilis, Veterinary Surgeon.

The subject of this case had been treated for indigestion from the 29th of October to the 5th of November, when she was condemned as incurable. But before destroying the animal, the proprietor sought the advice of M. Gilis, who attended on the 6th, when he learnt that the cow was seven months gone in calf, and that a double gestation was suspected, on account of the extraordinary size of the abdomen; that on

the 29th of October, after a copious meal, the size of the abdomen had greatly increased, and that it appeared as if she were meteorised, animation being suspended, and the appetite lost; that the owner had submitted the animal to the examination of two veterinary surgeons, who diagnosed indigestion; that the abdomen had increased to an enormous size; that on the 3rd of November the posterior part of the body had become paralysed, and the patient could no longer stand; and on the 4th, that strong expulsive efforts were made.

On entering the shed, the author found the cow extended on the litter, supporting herself on the sternum; her head extended, respiring with great anxiety, continually moaning, in a word presenting all the symptoms of approaching asphyxia. The volume of the abdomen was monstrous; percussion gave a dull sound, and by pressure a seeming fluctuation was detected; there was a tremor about the shoulders; colicky pains and twitchings of the hind extremities existed; at times she made strong but ineffectual efforts to get up; she often changed her position, but the anterior parts alone were moved, the posteriors being dragged as if they were a dead weight; no appetite, and rumination had ceased; the alvine evacuations were scanty and voided with difficulty; the rectum hot and distended with fæces, the expulsion of which seemed to be prevented by a tumour the size of a man's head. This tumour could be easily felt through the vagina, but was rendered more prominent by the expulsive efforts made, and which were more violent through the rectal and vaginal explorations. It was formed by the left cornu of the uterus, which was distended with serum, and by the efforts of the animal forced into the pelvic cavity. Carrying the investigation to the uterus, the vagina was found to be red and hot; the os uteri was dilated enough to admit three fingers, but it was obstructed superiorly by the fœtal membranes, which, when raised by the index finger, were easily torn by the nail. This was followed by the escape of a large quantity of serum; and on penetrating further with the fingers into the uterus, dropsy of the amnion was found to exist, complicated with metritis and the presence of a dead fœtus.

Notwithstanding that speedy death was prognosticated, actuated by curiosity the author caused the expulsion of the fluid contained in the uterus by dilating the os uteri with his finger and thumb. This was followed by the rejection, in different expulsive efforts, of about seventy litres of clear yellowish serum, which caused a sensible decrease in the size of the abdomen, and a fictitious improvement of only short

duration was the consequence, as death took place on the 8th of November.

The fluid which escaped from the parts up to the time of death, was from 100 to 110 litres.

The autopsy revealed acute metro-peritonitis, with a dead fœtus in the right cornua, which was of an extraordinary size, and abnormal position of the uterus. The fœtus was not decomposed, showing that its death had been recent. The amnion contained from two to three litres of serum.

It is very important to be able to diagnose the existence of dropsy of the amnion, on account of the gravity of its nature and also of its being easily confounded with a double gestation, indigestion, or ascites; and also of its being a cause of abortion. Had this been treated before the complication of metritis took place, it might have been cured. The hydropsy from certain causes must have shown itself in the first months of gestation, and progressed without interfering much with the general health of the cow until the 29th of October. The death of the fœtus was caused first by the pressure of the fluid, which prevented the normal exercise of its function. Secondly, by the difficulty in the respiration of the mother, which, by disturbing the circulation, prevented the nutrition of the fœtus; to which must be added, the undue dilatation of the uterus at an inopportune time. The metro-peritonitis supervened after, and was consecutive on the presence of the dead fœtus; and not unlikely the unnatural distension of the uterus also depended on this.

Clinique Vétérinaire, January, 1862.

SPECIFIC OPHTHALMIA; ITS CAUSES, TREATMENT, &c.

By M. Demilly.

Some authors attribute the cause of specific ophthalmia to dentition, and the use of hard and dry forage and grain, which by the hardness and difficulty in the mastication thereof produce a determination of blood to the head. M. Demilly has no faith in this. Others have asserted that the more common cause is to be found in the topography of the country, in the constitution of the soil and its productions, the nature of the aliments, and in the darkness and bad construction of the damp and undrained stables. These, M. Demilly considers far more likely and rational causes; only that most of them seem to act on the temperament of the

animal, and therefore to affect the eyes in an indirect manner.

The true cause, he says, is in the debility of the constitution, the lymphatic temperament of the animal inducing general debility in the individual, and especially those of a gross and lymphatic constitution. Such are most subject to this affection. The fact is, though it has not been recognised by some authors, that horses bred in the marshy districts near Huningue, and Belfort, Charente, Basse-Auvergne, Limagne, Bas-Languedoc and Bas-Cotentin, are more subject to specific ophthalmia than those bred in the arid and dry mountainous regions, where it is of rare occurrence. Hereditary predisposition has also been considered as one of the causes of this disease, but in medicine and physiology the agreement of several cases are often necessary to establish the fact, and here we must not limit the development of this affection to the influence of one cause. Hereditary disposition may determine the affection in a lymphatic subject, but it would not suffice in a subject which by being placed under different circumstances has acquired a strong constitution, so as to be able to resist or lessen the effect of this influence, that is to say, there may exist an hereditary predisposition, but which might be nullified by change of locality and improved diet. If that in many cases the result of a number of observations has not led to the conclusion that it is hereditary, it is nevertheless certain that by transmitting from generation to generation a constitution or a predisposition favorable to certain maladies, we may by means of aliment and locality ameliorate if not prevent hereditary predisposition. The gastro-enteritis or influenza which prevailed in 1825 in Paris, and which has at certain periods reappeared, with some modifications, in different parts of France, has often been followed by specific ophthalmia; and simultaneously with the first symptoms of this malady, or shortly after, when there has suddenly appeared an affection of the globe of the eye, bearing a striking resemblance to specific ophthalmia, if it be not the same affection, either symptomatic or consecutive and accessory, having the same results, and by its access and intermittent nature, more or less frequent, it deteriorates the eyes, and produces blindness of one or both.

All maladies of the type of that prevalent in 1825 may therefore be considered as one of the causes of specific ophthalmia; but only in so far as by regimen and treatment fresh accessions have not been guarded against. It would be too absurd to mention here the influence of the moon, to

which these returns have been attributed by ignorant persons; if it were so, the attacks would be regular and simultaneous on all those animals who are subject to this malady. If specific ophthalmia, the author observes, is to be attributed to a diathetic state, and to a feeble and lymphatic constitution, it would necessarily follow that the abstraction of blood might also become an occasional cause of it, and consequently hasten its development, or precipitate its access. At the beginning of my practice, he further states, many proprietors were in the habit of having their horses bled, without any reason, once or twice a year. I have often seen specific ophthalmia follow these bloodlettings. Thus, on the 22nd of October, 1828, I bled some horses belonging to a manufacturer of Rheims. On the 23rd and 24th of the month I was sent for to see two of the horses, which were affected with ophthalmia. On the 30th of October, 1829, I bled four horses at another manufacturer's; on the 3rd of November one of them was affected with ophthalmia in one eye. In 1836 I observed the affection in a horse after the section of the tail. In 1834, a woolstapler requested me to bleed his horse, and on the 10th it was attacked with ophthalmia. On the 4th of May, 1829, the malady developed itself on a horse of M. Gras which had been bled two days previous. Finally, he adds, I have seen specific ophthalmia supervene on bleeding at MM. Lemoine, Lajoye, Reneville, Franconni, Strapport, and several others.

The withdrawal of blood must therefore be considered as a disposing cause of specific ophthalmia, and as calculated to aggravate the disease in those animals which are already affected by it, or those who are predisposed to the malady through constitutional debility. The author also remarks, that he has observed that those circumstances which predispose to inflammatory diseases, have no influence on the development of specific ophthalmia, while all those which have a contrary tendency will either cause its development or aggravate its attacks. Dust, hay-seeds, blows, &c., are not to be reckoned amongst its causes; but dark, damp, and badly ventilated stables, the heat caused by the confinement of the blinkers when the animals are at work, sudden transitions from heat to cold, the reflection of a strong light, working with the feet and legs in the water, as when towing boats, or on marshy land, or even calcareous soil, or under ground in mines, &c., are undoubted causes that will determine and aggravate the attacks of this malady, and are to be avoided in all cases where there is a predisposition to it.

The treatment recommended is rational. Antiphlogistics

are to be avoided, and bleeding is condemned as most dangerous. Even if you are sure that the inflammation is acute, and the subject is not of a lymphatic constitution, bleeding should not be resorted to in affections of the eyes, as, in the opinion of the author, it is never attended with benefit. But when the eyes present the gray, slaty, or greenish colour of the cornea, and aqueous humour, with the other ordinary symptoms, then bleeding should be most carefully avoided, and no debilitating remedies employed, for instead of these promoting the cure, they weaken the parts and aggravate the disease. A convert to the physiology of Broussais, at my exit from the school of Alfort, the author adds,—when a horse was presented to me, having an affection of the eyes, presenting weeping, tumefaction, redness of the lids, &c., I always bled, and ordered a low diet for the patient, and to this generally followed the antiphlogistic treatment, but it was always without any good effect; and as it was the general opinion that this malady was incurable, I did not feel disappointed at the number of unsuccessful cases that came under my care. But soon the following case occurred:—In June, 1828, a lady of Rheims had a mare which had a foal, this was sent to a farmer in the Ardennes at five years old. It was sold to a post-master, having had two attacks of specific ophthalmia. I was consulted on the case by the post-master, who had taken the affection of the eyes into account at the time of the purchase, and I recommended bleeding and a restriction of the rations of oats, in order to preserve the sight as long as possible. The owner, however, did nothing of the kind. Bad eyes, he said, did not prevent the horse doing post-work, while bleeding and a short allowance of oats would have prevented it; for the present he must work, and when he is knocked up you may bleed him. The fact was, that the horse worked for three years, during which time he had no attack of ophthalmia. Afterwards, his legs failing him, he was sold, and put to farm work, where he was fed on a less stimulating diet, and soon after the malady reappeared. The sight of the right eye was all but lost, and the left eye was seriously compromised in less than a twelvemonth after. Sixteen months after this the horse was sold for the third time to run in a diligence, when he was again put on full allowance of oats, &c., and his sight soon recovered, and he had no fresh attacks of the malady. From this time, the author says, my faith in the various therapeutics recommended for specific ophthalmia was effectually shaken.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD JANUARY 22, 1862.

The President, F. R. SILVESTER, Esq., in the Chair.

PRESENT: — Professors Spooner, Simonds, and Gamgee; Messrs. Moon, Ernes, Harpley, Wilkinson, Mavor, Lawson, Aitkin, Hunt, Cartledge, Gamgee, Jex, Dickins, Barrow, Withers, Broad, Robinson, Dray, Pritchard, Field, and Braby.

It was proposed by *Mr. Ernes*, and seconded by *Professor Gamgee*, "That an address of condolence on the lamented death of the Prince Consort be presented to Her Majesty, signed by the President, with the seal of the College attached thereto." Carried unanimously.

A letter was read from Mr. E. N. Gabriel, tendering his resignation as member of Council, and also as member of the Court of Examiners.

It was moved by *Mr. J. S. Gamgee*, seconded by *Mr. Wilkinson*, and carried unanimously, "That the thanks of this Council are hereby tendered to Mr. E. N. Gabriel, for his faithful devotion to the interests of the veterinary profession during the sixteen years he has been officially connected with the body corporate."

The financial statement of the funds of the College showed a balance in the bankers' hands of £577 13*s.* 4*d.*

The following report from *Mr. Ernes'* committee, appointed to protect the interests of the veterinary profession, was read:

"That as a preliminary step, it is in their opinion necessary to obtain a statistical account of all those practising the veterinary art without being duly qualified.

"Your committee propose that a circular be sent to every member of the profession in the United Kingdom of Great Britain and Ireland, requesting them to furnish the names, residence, and time they have been in practice, &c., and of those in their respective neighbourhoods who are so practising, but as your committee is not provided with the necessary funds for expense of postage, printing, &c., they now apply to you to grant the same."

It was resolved that a sum of, not exceeding £20, be placed at the disposal of the committee for the purpose of carrying into effect the object of the report as adopted by the Council.

The adjourned consideration of Mr. Wilkinson's motion relative to the late examinations in Scotland was proceeded

with, when a report and letters from the Board of Examinators at Edinburgh, were read.

A motion was then made, and carried unanimously, as follows:

"That the letters now read from Dr. Struthers be entered on the minutes, and that their receipt be acknowledged, with an expression of regret on the part of this Council, that during the illness of the late secretary those communications were mislaid, and hence not read before this date."

A resolution was carried, "That those students who passed their examination in Scotland on the 29th and 30th of April last, be entered on the register of the Royal College of Veterinary Surgeons."

It was moved and carried "That the amount due to the Court of Examinators for Scotland be forthwith paid."

A vacancy having occurred in the Council in consequence of the resignation of Mr. E. N. Gabriel, the following gentlemen were proposed to fill the vacant seat: Messrs. W. H. Coates, J. B. Henderson, and Lupton; upon the ballot being taken, Mr. Coates was declared elected.

The next business proceeded with was the election of a Secretary. Agreeably to the clause in the charter, that the Secretary must be a member of Council, it was proposed by *Professor Spooner*, that Mr. W. H. Coates be elected Secretary. Upon being balloted for, he was declared unanimously elected to the office.

E. Braby,
Secretary, pro tem.

Veterinary Jurisprudence.

COURT OF COMMON PLEAS, Feb. 5.

(*Sittings at Nisi Prius, before the* Lord Chief Justice Erle *and Special Juries.*)

MICHAEL *v.* THE MIDLAND RAILWAY COMPANY.

This was an action brought by the plaintiff to recover compensation from the defendants for injuries to a horse whilst in transit on the defendants' line, through the alleged negligence of their servants.

The defendants denied their liability.

Mr. Hawkins, Q.C., and Mr. M'Intyre were counsel for the plaintiff; Mr. Macauly, Q.C., and Mr. H. Lloyd for the defendants.

After the jury had been locked up some hours, and there was no chance of their agreeing to a verdict,

A juror was withdrawn on terms, on the recommendation of the learned *Judge*.

COURT OF EXCHEQUER, Feb. 5.

(*Sittings at Nisi Prius, at Westminster, before* Mr. Baron Martin *and a Special Jury.*)

HANDLAY *v.* RICKARBY.

Mr. Hawkins and Mr. D. Keane were counsel for the plaintiff; Mr. Collier and Mr. Talfourd Salter for the defendant.

This was an action on a breach of warranty of a horse. The plaintiff, Captain Handley, who formerly held a commission in the Scot Greys, resides at Barton Court, near Hungerford, Berkshire, and the defendant is stud groom to Captain Popham, who lives in the same neighbourhood. In November, 1860, the plaintiff went to Captain Popham's stables to look at some horses, when the defendant inquired if he required a good weight-carrying hunter—a bay gelding, about five years old. The plaintiff did not then purchase him, but subsequently he agreed to give £110 for the horse, on the understanding, as he alleged, that the plaintiff was to have a warranty of twenty-four hours, to enable him to have the horse examined as to his soundness, which the defendant did not warrant. The horse was sent to Mr. Mavor, of Park Lane, London, who pronounced him unsound; so, as the defendant refused to take him back, he was sold at Tattersall's for £26, and the present action was brought to recover the balance,

The case for the defendant was, that he did not give any warranty, but that he said he would take the animal back if not approved of, if returned by nine o'clock the following morning, which had not been done.

This was the only question in the case, and the jury found for the plaintiff, damages £87 10s.

COURT OF EXCHEQUER, Feb. 13.

(*Sittings at Nisi Prius, at Guildhall, before the* Lord Chief Baron, *and Special Juries.*)

JACKSON *v.* HARRISON.

This was an action brought by the plaintiff, a farmer at Gartan, in Yorkshire, against the defendant, who is the manufacturer of "Harrison's oil-cake for feeding cattle," to recover compensation in damages for the loss of a great many cattle, alleged to have been killed by certain injurious and poisonous matter contained in the oil cakes.

The defendant pleaded not guilty.

Mr. Digby Seymour, Q.C., Mr. Serjeant Ballantine, and Mr. H. Thompson, were counsel for the plaintiff; Mr. Frost, Q.C., and Mr. J. Brown for the defendant.

It appeared from the evidence, that the plaintiff occupied a farm of 500 acres, on which he kept a considerable number of cattle. In the months of February, March, and April, 1861, he purchased three separate tons of oil-cake of the defendant. The first lot seemed to agree with the cattle very well, but the second and third did not. It seemed to reduce and degenerate the beasts, in consequence of which the plaintiff doubled the quantity that he usually allowed them; but instead of doing them any

good, they appeared to get worse, and eventually they died off one by one, until he lost two cows, seven oxen, ten sheep, and twenty lambs. The plaintiff at last began to suspect the cake, and sent a quantity of it to several analysing chemists, and amongst others to Dr. Letheby and Dr. Hassell, who discovered a quantity of small hard masses, so hard that they could find no solvent that would in any way produce the slightest effect upon them. They were often found in linseed of the commonest class. They (the medical men) had no doubt that these seeds caused an irritation in the stomach, and thus produced death.

The plaintiff, in cross-examination, said that he had a stack of oats in the straw-yard. He did not tell the defendant that they were bad oats. His cattle had fed upon those oats. He had a mare which died about the same time that the beasts and sheep died. She had been fed upon the same oats. She had never had any of the oil-cake. There was a company formed at Griffield, in Yorkshire, called The Joint-Stock Linseed Cake Company. They promised to assist him if he lost the action.

Dr. Letheby said that he had performed a post-mortem examination on two beasts which had died from partaking of the oil-cake, and he there found the same kind of seeds. He had no doubt, therefore, but that they were the cause of death.

At the conclusion of the plaintiff's case, Mr. Frost submitted that the plaintiff ought to be nonsuited. It was clear that the cattle had died from eating the oats.

Ultimately the learned *Judge* nonsuited the plaintiff.

MISCELLANEA.

THE GOOD OF PAIN.

Pain is a blessing, says Dr. Hall, it is the great life-preserver; it is the sleepless, faithful sentinel which gives prompt warning that harm is being done. All pain is experienced through the nerves; they telegraph it to the brain, and there the mind takes note of it. Pain is the result of pressure on or against a nerve; that pressure is made by a blood-vessel, for there is no nerve without a blood-vessel in close proximity. A blood-vessel is distensible, like an india-rubber life-preserver—both may be full and yet may be fuller. In health, each blood-vessel is moderately full; but the very moment disease, or harm, or violence, by blow, or cut, or otherwise, comes to any part of the body, nature becomes alarmed as it were, and sends more blood there to repair the injury—much more than is usually required; that additional quantity distends the blood-vessels, and gives disquiet or actual pain. In these cases this increased quantity of blood is called "inflammation;" and if there is not this increased flow to the injured part, there is no healing, and that part dies, unless some stimulating application is made.

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Communications and Cases.

ON SOME OF THE DISEASES OF THE STOMACH AND INTESTINES OF THE HORSE AND OTHER ANIMALS.

By Professor Brown, M.R.C.V.S.,
Royal Agricultural College, Cirencester.

The pathology of the abdominal organs is often exceedingly obscure in its indications. Commonly symptoms, indicative of intense pain, are all the practitioner has to help him to a diagnosis; and not unfrequently he is compelled to pursue a course of treatment which has for its object the relief of suffering, rather than the cure of the disease on which the pain depends, and of which he is probably compelled to remain in ignorance until a fatal termination enables him to inspect the affected organs.

Diseases of the Stomach are constantly associated with intestinal derangement, although not invariably so; for example, there are certain well-known diseases, particularly in cattle and sheep, which are specially confined to the stomach or a portion of it.

The occurrence of mechanical distension by gas, or excess of food, is not unusual in cattle and sheep, and not unknown among horses that are rapid feeders; nor is a fatal termination uncommon in any of these subjects.

Tympanitis may be considered the most simple and tractable of stomach affections. It always arises from an interruption to the digestive process, and the extrication of certain gaseous compounds, products of putrefactive fermentation. The pressure exerted by the gas on all sides closes the communications between the stomach and the tubes leading to and from

it, and permits an accumulation to an enormous extent. The respiratory function becomes gradually more and more difficult, from the interference with the action of the diaphragm, and ultimately the animal, if not relieved, dies from asphyxia. Occasionally the elimination of gas is so rapid that death has occurred before aid can be rendered; this, however, is not a common circumstance.

Tympanitis in the horse generally extends to the intestines. Indeed, the colon in its larger portion is more usually affected than the stomach. This latter viscus, however, is not exempt, as a recent dissection proved in the case of a horse that had been for years a "wind-sucker." The animal died from an acute attack of intestinal inflammation, and during the post-mortem examination, the stomach was found at least twice its proper size, and as thin in its coats as an inflated bladder. The same condition extended to the œsophagus, to about half its length. No obstruction existed, nor did either the stomach or œsophagus manifest the least tendency to return to their ordinary dimensions after being kept for days. The function of the muscular fibre seemed to be altogether lost; affording a remarkable instance of the effects of a constantly acting distending force.

Under the gradually applied force exerted by the gas, it is most reasonable to suppose that muscular irritability will become impaired; and hence both the stomach and the intestines lose the power to assist in the expulsion of their gaseous contents. A sudden distension, we are aware, acts as a stimulus to muscle, and excites contraction; the contrary is true of a force gradually applied and continued for a considerable time. In practice we have often noticed than an acute case of tympanitis—one that threatened serious consequences from the rapidity and degree of the distension—has been immediately relieved by the exhibition of a drench, whose principal effect apparently was to open the communication between the stomach and its outlets, and thus permit the escape of the gas into the intestines and up the œsophagus, the contraction of the muscular walls of the stomach assisting the process with energy. In other instances, comparatively slight distension has occurred, and proved exceedingly annoying, and in spite of surgical and medical treatment has continued for days.

When properly directed, the treatment of tympanitis may be considered to be uniformly successful. The decomposition of the gas will hardly, we fancy, be the principal object of our remedies. Indeed a large volume of carbonic acid, sulphuretted and phosphuretted hydrogen, with other pro-

ducts, could not easily be fixed by a small dose of medicine, even if it contained the necessary elements for the purpose. That these gases are present even at the commencement may easily be demonstrated, so that the well-known beneficial effects of ammonia cannot be ascribed to its forming a compound with the carbonic acid, which is probably the least objectionable of the products given off. The position is further negatived by the fact that the carbonate of ammonia is equally effective.

Our principal object in the treatment of the disease is, or should be, to promote the expulsion of the gas, and by restoring the function of the stomach to prevent its further accumulation; hence cardiac stimulants, such as brandy, ginger, pepper, and the like, are popularly and successfully employed for the purpose. These stimulate the nerves of the stomach, assist the restoration of its impaired irritability, aud promote expulsion of the gas. In this way, also, the salts of ammonia act. By the employment of antiseptics, we arrest the decomposition; and probably the effects of chlorate of potash and hyposulphite of soda, may be ascribed to this circumstance. Added to the direct medicinal action of the agent given, is the mechanical influence exerted by the fluid or solid in opening the obstructed channel of the œsophagus, as well as the action by contact with the membrane of the stomach.

Among the remedies we have tried, none bear comparison with the hyposulphite of soda; given in two-ounce doses and dissolved in a pint of warm water. Half the quantity may be administered in half an hour after, if necessary, the animal meanwhile being kept in motion. Since Professor Morton suggested to us the use of this drug, we have not had occasion to puncture the rumen once. Nor should we consider the operation, although formerly a very frequent one, at all desirable unless in a case where suffocation was threatened.

Tympanitis in sheep is treated in precisely the same way; the dose of the hyposulphite being half an ounce. The shepherd and cattle-man are provided with a supply of this agent, and our attention is now scarcely ever called to these cases at all.

Tympanitis in the horse commonly gives rise to spasmodic contractions of the intestinal muscles, and is denominated "wind colic" by the attendant; nor is the expression inapt. A cardiac, or general stimulant, on the principle we have discussed, is the ordinary and appropriate remedy, external frictions and exercise not being neglected in cases that do not immediately yield to the medicines exhibited.

Stomach distension by accumulation of food is on all accounts a

more serious matter. Cattle, sheep, horses, and pigs, are the sufferers—probably sheep to the greatest extent. The disease is commonly termed "grain sick," "clover sick," and "stomach staggers."

In every instance it may be traced to an excessive consumption of food. Among horses we have known it often to arise from a greedily swallowed meal of coarse and bulky food, after a long fast. In cattle, a large quantity of roots or green food, particularly when they contain an excess of moisture from absorption of the wet to which they may have been exposed, will produce distension. Sheep turned into a field of clover of luxuriant growth, will, if they have been previously kept from succulent diet, eat so rapidly and freely as to cause fatal distension in an hour or two. Not long since a number of sheep were so treated, and in about two hours several were found lying dead, and many, indeed nearly all, much distressed, several of them dying in the course of the day.

The condition of the stomach is manifested by symptoms that are generally very characteristic.

Horses are usually dull and heavy in appearance, sometimes to the extent of absolute coma. When the distension is not extreme, and the brain is yet scarcely affected, there are indications of abdominal pain, in association with the peculiar symptom of turning up the top lip. Not that this can be considered diagnostic, as it is often seen under other circumstances.

Cattle and sheep suffer most from the pressure of the distended rumen upon the diaphragm. They are always much distressed, making frequent attempts at eructation; the saliva is discharged from the mouth in increased quantities, and the swollen sides testify, by their yielding and pitting upon pressure, to the nature of the contents of the viscus, and prove that the disturbance is not due to the extrication of gas only, although inevitably, in every case, tympanitis is a concomitant.

In the horse, the disease, if fatal, terminates in death by coma, or by rupture of the stomach.

In cattle and sheep the death of the patient can always be safely referred to asphyxia. Rupture of the rumen from distension is nearly impossible, as the respiration would cease from mechanical interference with the movements of the thorax before the rumen had reached the limits of its expansive capabilities.

The treatment is not usually satisfactory in its results. The paramount object is to remove the mass by increasing

its fluidity, and restoring the impaired muscular action of the stomach. For this purpose doses of purgative agents in solution are exhibited.

Cattle and sheep are relieved from immediate distress by the use of the probang, or by a puncture of the rumen. The hyposulphite of soda has been employed also with benefit. An entire abstinence from solid food will, of course, be insisted on during the treatment. The operation of opening the rumen and removing the accumulated mass we cannot speak of from experience. That it may be successful in some instances is quite probable; but under ordinary circumstances it can scarcely be considered a justifiable proceeding.

(*To be continued.*)

ACTION OF INDIAN HEMP IN PARALYSIS.—CASE OF RUPTURED STOMACH—PARACENTESIS ABDOMINIS.

By J. R. Hoey, M.R.C.V.S.,
V.S. Her Majesty's 3rd Brigade Horse Artillery, India.

Landour, N. W. Provinces, India.

Gentlemen,—In continuation of my remarks in a letter to your address, dated 1st July last, and in compliance with my promise contained therein, I am induced to offer a few more observations for publication, if you consider them worth a place in your journal.

I may be permitted to remark here, with reference to one or two cases narrated in my last, in which Indian Hemp ("*bhung*") was used, that I am fully prepared to be told, especially in the case of ringbone, where paralysis supervened, that the extensive tumefaction among the psoas muscles, posterior to the right kidney, was *the cause* of the paralysis. Further, that this enlargement, by compressing the sciatic and sacral nerves, cut off the nervous force, and that paraplegia was the result. This would account also for the urine dribbling away involuntarily, seeing that the bladder under such circumstances would be almost necessarily implicated. Of course it will be said that when resolution took place, and the tumefaction was dispersed, the cause of paralysis being removed, then sensation and motor power returned, and the animal recovered. Further, that the "*bhung*" in this case simply acted as any other narcotic would have done, and that we are not to look to *narcotics* but to *stimulants* to bring

about the normal state of parts subsequent to paralysis. All this, and perhaps much more, I am prepared to be told, and therefore I forestall it all.

We know that paralysis is dependent upon many circumstances, and that it arises often from a solution of nervous continuity, which may be either mechanical or idiopathic, if I may be allowed the use of the term. We also know that where mechanical pressure is the cause, and when it has existed any time, sensation may and does often return, but not always with it the motor power. In the case related, both sensation and motion were lost for days, and both returned simultaneously. It might, however, have not so terminated; the motor power might have remained dormant, a state in which perhaps galvanism is indicated as the active agent towards restoration. When "*bhung*" is administered to the human subject, it primarily acts as a violent excitant, which is followed by sedative effects. I would not proclaim "bhung" as the *restorer* of power and sensation *in this particular case*, or any case of like nature, and therefore I gave its action in a number of cases. I merely wish to introduce the agent to the notice of my professional brethren as an all-potent narcotic; one that acts powerfully upon the sensorium and nervous tissues generally, without inducing constipation or any of the ill effects following the exhibition of opium, and to induce them, in their practice, to ascertain how far it is a specific in tetanus and nervous affections generally, and having done this, I am content to leave the solution of the question in their hands.

Since I wrote to you in July last, I was called in to see a charger, the property of an officer of the Dragoon Guards, suffering from distension of the stomach, accompanied with tympanitic colic.

On my first approaching the animal, I made a remark respecting a discharge of a dark colour from both nostrils, but the owner attributed it to a drench he had given the horse previous to calling me in. I told him I hoped it was not vomition, as if so, the case might prove fatal.

The animal had had several fæcal evacuations, but had not urinated.

When colic and tympany are coexistent to any serious extent, I am in the habit of prescribing, in the absence of a better remedy, the sesquicarbonate of ammonia in a ball, followed by a go-down or two of water. I was compelled to do so in this instance, though I am inclined to think the spiritus ammoniæ aromaticus a better compound.

It was with some trouble, however, that the sesquicar-

bonate of ammonia was procured; for being entirely without medicines and instruments of any kind—not even a syringe was procurable to administer an enema—I was practising under difficulties.

On the subsidence of the tympany, together with a profuse flow of urine, and after the exhibition of the ammonia, and constant fomentation, the owner did not seem to wish any aloes to be given, as the case did not appear at that period a dangerous one, there being neither much injection of the membranes, nor accelerated pulse; so I left the patient, giving the owner a prescription for an antispasmodic draught, combined with oleum lini, to be given at bed-time, if necessary; also with further instructions, that, if any violent symptoms set in, I was immediately to be called.

The owner, however, appeared so satisfied that all was right after the animal had staled and passed an immense quantity of flatus, that he did not seem to think there was much chance of my being wanted again. The orders I had given, and the prescription left, showed, however, that I was neither so sanguine or sure of the result as he was; the discharge from the nostrils having induced these fears.

At eleven o'clock at night I was again sent for, and reached my patient at twelve. I found the former symptoms had returned; a distended stomach with all its concomitant symptoms could be safely diagnosed, and vomition was now a distinct feature.

The fomentation was continued by means of blankets wrung out of boiling water, and held up against the abdomen by a man on either side. After a little difficulty and delay, some aloes was procured, and ʒviij of the Barbadoes extract exhibited in a pint of warm water. Soon after this, all attempts at vomition ceased, the usual symptoms antecedent to dissolution set in suddenly, and the animal died towards morning. I told the owner that in all probability he would find the animal's stomach ruptured, and offered at once to make a post-mortem examination, to which he consented, and before I left the sequel proved satisfactorily to the owner the correctness of my diagnosis.

Ruptured stomach is a very common occurrence in India, and last year, when sickness was rife all over India, and forage scarce and bad, I had several cases. It has been stated, by some author I think, that vomition is "*a sign*" of ruptured stomach. I cannot concur in this view. The stomach is like a muscle, and when distended beyond its power of contraction, becomes a dead weight, liable to rupture itself or the diaphragm at any moment during the

paroxysms and violent struggles of the animal. Until rupture of the organ takes place, spasmodic attempts at vomition are constantly present, but the moment the viscus is ruptured, *this action ceases*, and therefore it cannot be "*a sign*" of ruptured stomach. As long as the endeavour to vomit continues, there is hope, but the moment this ceases, and the concomitant symptoms do not subside, but become aggravated, we may prognosticate an unfavorable result.

If we could by mechanical means empty the stomach, we might save some of these cases, but such means are not provided for in our department.

It has been stated that the cuticular portion of the stomach triturates the food like the gizzard of a fowl. Is it not rather probable that both it, and the lining membrane of the œsophagus, are so providentially disposed and thrown into folds as to permit of distension under extraordinary circumstances, the muscular coat being the active agent in effecting its return to its normal condition? And, further, that the mouths of the mucous follicles, by being embedded and hid in these rugæ or plicæ, are defended from the mechanical injury they would otherwise be exposed to by hard, *and oftentimes indigestible,* food during the action of trituration or comminution?

During the time that this mechanical distention exists, fermentation is generally actively going on. In only one case, however, in a practice of above twenty-four years, do I recollect the tympany to be so excessive and unyielding as to call for paracentesis abdominis. In this case, after all remedial measures had in every way failed, I plunged the trocar into the colon. The result was, the disengagement of a large volume of gas; but the instruments supplied us not being on all occasions *veterinary instruments,* I did not foresee that the trocar was short, and I fancy as the volume of the distended bowel subsided, the canula fell away from it, and thus the object of the operation was in a measure defeated. The elimination of gaseous matter continued unabated, and the animal died shortly after.

The post-mortem examination shewed very little inflammation as resulting from the operation, and nothing but what the usual depletory measures would have combated.

I am, yours, &c.

To the Editors of 'The Veterinarian.'

ABSCESS IN THE COATS OF THE STOMACH OF A MARE.—A SEQUELA OF EPIDEMIC CATARRH.

By R. Hudson, M.R.C.V.S., Retford.

An unfortunate case came under my notice in the autumn of last year. It was that of a five-year-old good cart-mare. All the working horses on the farm, consisting of five or six, were attacked with epidemic catarrh. In the mare adverted to, the abscesses at the jaw were longer in forming than in the others, and the discharge continued longer; the animal, also, lost more flesh, and on that account, and being the best mare, she was turned out to grass for a little while, and then put to slight work. After being at work a day or two, at times she showed symptoms of colic, and when I was sent for, on the 26th of October last, the pain seemed of a subacute character, but it did not leave her quiet for long together. Thinking it might arise from the work and change of diet, I gave an anodyne draught and an aperient ball, and saw her again on the 28th. The aperient had acted slightly, but she seemed very dull, weak, and in pain. I offered her a little water, and after taking two or three mouthfuls she made two decided attempts to vomit, but which I at the time took for choking. I had her led gently out into the paddock, to see if she would attempt to graze. After walking perhaps twenty or thirty paces, she laid down quietly, and in a natural position, as the lad was leading her. She showed no symptoms of pain when down, snapped at the grass now and then, and rose again with a little urging. I told my employer that there might be abscesses forming internally, and her chance of recovery was very small. I also considered that the formation of the abscesses might be near the œsophagus, from her showing symptoms of vomiting or choking. On the 28th she ate moderately, and on the 29th was not seen to show that unfavorable symptom any more. She ate most of her supper at night, but was found dead in the morning, and so cold that death must have taken place early in the night.

I attended the autopsy on the 30th. On opening the cavity of the abdomen, the cause was at once plainly seen; there being nearly a barrowful of food among the intestines and a large rent was found in the stomach, whence it had issued. Among the food which remained in the stomach there was some purulent matter, which caused me to look more minutely, and I found a hole which would admit a wal-

nut, about an inch from the termination of the œsophagus, smooth around the edges, as if the discharge of pus had existed for some time. An abscess had formed between the coats of the stomach, and there was a good deal of thickening in its vicinity, but the rupture, as you have already perceived, had not taken place at the seat of the abscess, but along the greater curvature. Several times I have met with abscesses in the mesentery, a termination of strangles, &c., but this is the first I have seen in the stomach. I think in this case the abscess in the stomach had been forming along with the others. I firmly believe that the food had passed out at the rent as it passed in at the mouth, and that for at least two days before death, as the quantity found was as much as four times more than a horse's stomach could contain, and this is the only way I can account for the absence of more acute symptoms. The mare had lost flesh, and the membranes were blanched a good deal from the effects of the disease.

AN UNCOMMON CASE OF TRAUMATIC TETANUS.

By R. H. Dyer, M.R.C.V.S., Waterford.

The subject of the present paper is an aged gelding, the property of a client residing in the country. On the 28th of December last the animal was sent here to be fired in the hind legs for a very large ganglionic swelling, situated about the fetlock joints. My instructions were to fire severely, and to puncture the large sac, and introduce a seton if I wished. Upon examination I found the ganglion very hard indeed, and was of opinion that any treatment I could adopt would be useless. However, I carried out the instructions as far as I deemed prudent, which was simply using the actual cautery in an ordinary way, *without* penetrating the skin.

The animal was immediately taken home, and all appeared to be going on well, as I was informed. It so happened that the owner was riding to hounds on the 21st of January, and, unfortunately, the horse he was mounted upon met with an accident, having severely wounded the left carpus. A telegram was received by me, requesting a speedy attendance. When at the stables I asked to look at the horse which had been fired, and I was informed he was doing very well; but on opening the stable-door I perceived him to be *tetanic*.

Both the owner and the groom imagined that the cradle which was on the neck was the cause of the stiffness observed in the animal's head and neck. The latter individual also stated that the horse had exhibited the same symptoms for two days past, but no notice was taken of it. I became naturally anxious about the case, and at once instituted a careful examination, when I was of opinion it was a true case of tetanus, produced by the irritation of *firing;* the skin having separated and produced sloughing of the parts, and the animal in two days after was, so to speak, like a wooden one.

The treatment pursued in the absence of a Turkish bath was that of hot water and blankets. Several blankets were put into hot water, and when taken out wrapped upon every part of the horse, and kept in this state for several hours, until the animal could bear it no longer. He was then allowed to rest for two hours, and the application repeated alternately every two hours, of course attending to his bowels at the same time. The hot water caused copious sweats, which much relieved him. The muscles became relaxed, and I was in hope of saving my patient. In two or three days, the sheath, together with the abdominal integument, anterior to the pelvis, as far forward as the ensiform cartilage, became œdematous, as did also the thighs and other parts of the body. The fourth day I had some blistering ointment applied along the course of the spinal column, from the occiput to the coccyx, all of which tended to produce a remission of the symptoms. I did not lose sight of the abraded legs during the treatment, as I felt convinced that I should not be able to relieve the suffering animal unless I could succeed in establishing a healthy state of the parts. As the legs proceeded towards restoration so did the tetanic symptoms abate. The case progressed so favourably that I ordered walking exercise in a paddock, allowing the horse the privilege of partaking of some herbage during his stay there.

This state of things continued up to February 17th, when I saw the horse for the last time. He was then doing exceedingly well, and was, in fact, considered out of danger. I have learned since that he is so far recovered that he has not required any attention from me since the above date.

If my memory serves me, I recorded a case of traumatic tetanus some three or four years since, after the operation of subcutaneous periosteotomy in the front leg, which case terminated fatally; and, I think, I took occasion to remark that that animal looked (even when in an apparently healthy

state) tetanic. And so did this horse. There are some animals so stilty in their gait, that we should consider well the propriety of performing operations upon such without first giving due caution as to the risk.

Having had a case of rabies in the horse a few days since, I will take an early opportunity of sending the particulars of the same: I am too busy now.

CASE OF TETANUS IN A PONY.

By Chas. Cartwright, M.R.C.V.S., Abingdon.

I have thought that the following case of perfect recovery from an attack of tetanus may not be devoid of interest to the profession.

I was called in some three months since to see a pony, the property of a butcher in this town, which the owner informed me had taken cold from standing in the rain for a considerable time. On my visiting him, it was at once apparent that I had to do with a case of tetanus, the usual symptoms being present, but more strongly marked than any I had seen before. My entrance into the stable caused severe spasms; the haw at times was completely drawn over the eyes, and every limb was as rigid as possible; indeed I never saw such a specimen of intense suffering.

I did not give the proprietor the slightest hope of recovery; in fact, I recommended the animal to be destroyed. This however, fortunately, the owner would not consent to. I will sum up my mode of treatment in a general manner, without taking up your space by narrating all I did from day to day.

On the first and second days I gave

Opii, ʒj;
Aloës Barb., ʒij;

diffused in a small quantity of linseed tea, morning and evening, by means of a flexible tube. On the third, fourth, and fifth days I gave

Infus. Tabaci fol., ℥ij;
Tinct. Opii, ʒvj;

morning and evening, in a small quantity of linseed gruel which was swallowed with great difficulty.

Every attention besides being paid to my little patient: he

was gently rubbed every morning with a dandy-brush, and a warm fresh sheepskin was afterwards placed over his back and loins. Clysters were thrown up two or three times a day, and linseed gruel given him occasionally. This I was soon obliged to have discontinued, as the attempt to hold up the head caused the spasms to return in a greater degree.

On the fifth and sixth mornings the pains had become slightly relaxed. I could see that he evidently obtained some nourishment from the boiled linseed and bran, which were now placed in his manger four or five times a day, and I now gave the owner some little hope. The exhibition of the tobacco was continued twice a day, but I substituted 10 drops of Flemming's tincture of aconite for the tincture of opium, as the bowels were still rather constipated. After this, the pony convalesced daily, and the medicine was therefore discontinued. On the twelfth morning, as he could now open his jaws sufficiently to take in a large quantity of the slops given to him (mastication was still out of the question), I could see, barring accidents, that recovery was merely a question of time, and in about a fortnight from the commencement of the attack he was able to take a little exercise. The sheepskin being discontinued, a good dressing and a warm rug were substituted. The rigidity of the muscles did not perfectly wear off for five or six weeks, but the little sufferer is now doing his usual amount of work, and is perfectly well.

THE EVIL OF EMPIRICISM CONNECTED WITH THE PROFESSION.

By W. Elam, M.R.C.V.S., Huddersfield.

Gentlemen, — In looking over the 'Veterinarian' for December, I see that a move has been made in the right direction, by a committee having been appointed to consider what steps should be taken to protect the interests of the profession.

I hope in their deliberations that the question of questions, above every other to the veterinary surgeon, will be the first attended to, namely, making it penal, by law of fine or imprisonment, to any person having "Veterinary Surgeon" on or over his door, he not being a member of the R.C.V.S.; for I can assure you we are nearly eaten up by such persons in this part of the country, and I know of many other districts

where the veterinary practitioner can endorse the same sentiment. Take a statement of facts, and it will show you how veterinary practice is absorbed by empirics in this district, where there is sufficient practice within a circumference of sixty miles of this town to employ fifteen veterinary surgeons well, and enable them to appear as professional men should do. But how do matters really stand? There are twenty quacks practising as veterinary surgeons, besides twenty cow-doctors; and most of these latter also dabble with horses as well, when they can; and strange to say there are only three veterinary surgeons who are members of the R.C.V.S. within this wide circumference. But I doubt not that the committee are aware of the existence of such a state of things, having received similar statements from hundreds of other practitioners, although I hope not so bad as in this district. I am perfectly satisfied that this state of things could not long exist were we protected by law, which, in justice to the public and ourselves, we are entitled to. Besides this, it would be a great inducement to well-educated young men to enter the profession; and I hope the committee will never break up until it has accomplished this most desirable object. I also trust the whole profession will speak out, and rally round the committee with all the influence they can bring to bear, as well as the needful, to obtain so desirable and valuable a boon to the profession.

To the Editors of 'The Veterinarian.'

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AN OVARIAN TUMOUR IN A EWE.—AMPUTATION OF THE PENIS OF A HORSE.

By S. J. Wills, M.R.C.V.S., Axminster, Devon.

Gentlemen,—I have forwarded to you, addressed to Professor Simonds, a large tumour, which a gentleman in the neighbourhood sent to me this morning.

It was taken from a horned ewe that had been unwell for about a year and a half, and was supposed to be "code" (rotten), and latterly appeared to be in lamb. But the time of parturition being much past, and the ewe getting worse, she was killed. On opening the abdomen the tumour immediately protruded. It was attached, and found to weigh nearly 7 lbs. Unfortunately some cats got at it, and soon

reduced it to its present dimensions. It now weighs 5 lbs. The animal appeared otherwise in a healthy condition.

I am sorry I cannot give a better description of the case, not having seen the animal. I merely communicate it, thinking the size of the tumour extraordinary.

A week ago I amputated a horse's penis, in consequence of a large ulcerated warty excrescence surrounding its extremity. The portion taken off was about 6 inches in length, and weighed nearly 2 lbs. The person who was assisting me in the operation, let the penis slip from his grasp before I commenced cauterising it, and the organ quickly retracting, I failed to regain it. The horse being of little value, I soon gave up all attempts again to secure it; but on his rising, I was surprised to find that there was no hæmorrhage whatever. I gave a draught composed of

Ol. Tereb., ℥iij;
Ol. Lini, Oj;

and bathed the loins with cold water for an hour and a half.

About eight hours after, at midnight, I was called up to see the animal, as it was reported to be bleeding in a stream. However, on touching the end of the penis, which just protruded from the sheath, the animal retracted it, and the hæmorrhage ceased.

The owner remained with him some time, when it burst out bleeding again; and he then left him, saying, "There, thee may'st die if thee likes; I won't bother with thee any more." However, on going to the stable at 5 a.m., he found that the bleeding had again stopped.

There has been no hæmorrhage since, nor have any other unfavorable symptoms presented themselves.

I should think that during the operation and subsequently, the horse lost between two and three quarts of blood.

[The tumour was ovoid in form, and its general surface smooth and devoid of vascular congestion. It was covered with peritoneum, which had a perfectly normal condition. A section made through its long diameter showed the existence of a few small cysts, containing a limpid fluid. The cut surface distinctly proved that the tumour was an ovarian one, and seemingly of a benign character.]

Facts and Observations.

DIRECTOR OF THE VETERINARY SCHOOL AT ALFORT.

We learn from the 'Clinique Vétérinaire' for March, that Professor Magne has been nominated Director of the Veterinary School at Alfort, in the place of the late M. Delafond.

PLEURO-PNEUMONIA IN AUSTRALIA.

In Australia, says a Sydney paper, pleuro-pneumonia has extended to a terrible extent, and it is estimated that at least forty thousand cattle will have to be destroyed ere the disease is extinguished.

CONSTITUTION OF ALOES.

M. Kosman, having investigated the nature of Aloes, finds it to be made up of two substances, the one soluble, the other insoluble in water, but both soluble in alcohol. The first partakes of an extractive nature, the second of a resinous. Both are bitter, and when dissolved in a weak alkaline solution, they absorb oxygen. According to him, they consist of peculiar acids in combination with a hydrate of carbon, and are capable of forming a body answering to the reactions of grape sugar.

THE JERUSALEM ARTICHOKE AS FOOD FOR THE HORSE AND CATTLE.

It is stated that French cattle-breeders are paying considerable attention just now to the use of a root, which has not been introduced as food for animals in England—namely, the Jerusalem artichoke—or, as it is called there, poire-de-terre, or topinambour. It is said to present many advantages. It does not exhaust the soil; it reproduces itself for twenty-five or thirty years, and requires little or no manure. The

French declare the root in question to be unfit for use in cookery, although it is exposed for sale in the markets. The least fertile soil is said to produce 125 to 130 hectolitres per hectare, or about 888 English bushels per acre, and good lands will yield as much as double that quantity, and up to 90 tons per acre. The green tops are given to cattle and sheep, and the dry stalks are used for burning. The root is strongly recommended for horses, milch cows, and pigs, as well as for stock, but the latter are described as not caring at first for artichokes without a little salt, though they relish them amazingly if permitted to grub them up for themselves. The Jerusalem artichoke is stated to be unequalled for health and stamina; it is declared to have never yet been diseased like the poor potato, to be utterly unaffected by cold, dryness, and insects, and to remain in the ground without injury as long as convenient.

AGE OF BONES.

M. Couerbe considers that it is possible to know the age of bones by ascertaining, by analysis, the amount of nitrogenous organic matter remaining in them. He says that Vogelsang found, in bones that had been eleven centuries under ground, traces only of organic nitrogenous bodies, and hence he concludes that these disappear at the rate of three per cent. in a century. There are, however, certain conditional circumstances which would affect the correctness of the inquiry, as soil, integrity of the bone, &c.

TEST FOR GRAPE AND CANE SUGARS.

The triacetate of lead and ammonia, according to M Schmidt, produces, with both these sugars, white precipitates; but, on being heated, or allowed to remain for some time, *grape* sugar gives a red colour, while *cane* sugar remains unaltered.

ADULTERATION OF FIXED OILS.

It is not uncommon for many of the fixed oils to be adulterated with the oil of rapeseed. As the *cruciferæ* contain sulphur, it may be detected, according to M. Schneider, by means of nitrate of silver. For this purpose he dissolves one volume of the suspected oil in two volumes of ether, and to the mixture adds from twenty to thirty drops of a saturated

solution of nitrate of silver. Being shaken together it is allowed to rest for some time in a dark place, when, if much rape oil be present, the lowest layer will assume a brown colour, changing at last to a black; but if only a small quantity exists, the colour will be a brownish black.

ACCUMULATION OF ARSENIC IN THE SYSTEM.

Dr. Kech, having experimented on a horse with arsenic, found the poison in the saliva, the blood, the urine and excrement; the largest portion in the last named. He says that the elimination of arsenic by the urine takes place very slowly, and that it accumulates in the blood.

GASES EVOLVED DURING THE RESPIRATION OF PLANTS.

It has been long known that the organs of respiration in plants are the leaves, and that by them, under the influence of light, the carbon of the carbonic acid inspired becomes assimilated, and the oxygen is eliminated. Thus, too, a reciprocity is shown to exist between the two grand organic kingdoms, so called. M. Boussingault, however, has lately instituted a series of experiments, the results of which he has embodied in a memoir, presented to the French Academy, the concluding paragraph of which contains the following inquiries:—"Is it not curious that, after the lapse of a century, it should be established that probably the leaves of all plants, and certainly the leaves of aquatic plants, in emitting oxygen, which purifies the atmosphere, also gives off one of the most deleterious gases known, namely, oxide of carbon? May it not be permitted to infer, that in the emanation of this poisonous gas exists one of the causes of the unhealthiness of marshy districts?"

COMPOSITION OF COTTON OIL-CAKE.

Mr. F. G. Calvert, F.R.S., gives the following analysis, recently made by him, of cotton oil-cake, respecting which he says, it will be seen that it closely resembles in composition, linseed, rape, and all other oil-cakes used by agriculturists:

Albuminous matter	25·34
Fatty matter	8·46
Sugar and gum	7·71
Starch	10·73
Woody fibre	27·80
Soluble mineral matters	1·98
Insoluble mineral matters	6·16
Water and loss	11·82
	100·00

COMPOSITION OF STEEL.

Steel, according to M. Fremy, is no longer to be considered a carburet of iron, but nitro-carburetted iron. In every instance he has found nitrogen to be a constituent of steel. Depending upon the amount of this element retained in combination will be the character of the metal. Iron containing only a small portion is converted into imperfect steel, but when it is highly nitrogenized, very superior steel is formed.

COMPARATIVE POWERS OF MAN, THE HORSE, &c.

It is believed that the horse, of all animals, is the best adapted for labour. On the authority of Desaguliers and Smeaton, his power is considered as equivalent to five men. Bossut reckons that of the ass as equal to two men. M'Gauley states that the power of animals is derived from the combustion which is carried on in their bodies, and the heat derived from this source was originally absorbed from the sun's rays during the growth of those plants which, mediately or immediately, form their food; and hence, in reality, their force is derived from the sun.

In like manner he traces up to this source nearly all the "prime movers." Thus, he says, the power obtained from rivers is due to water raised by evaporation, which produces its effect while falling back to its original position in the sea. The force of the wind, also, is derived from the sun, which by rarefying the air in distant regions, causes atmospheric currents to be produced. The heat of all fuel is that which has been received from the sun during the chemical changes which take place in the growth of those plants that constitute not only the forests at present in existence, but those belonging to a remote period, and to which our coal-fields owe their origin. We need not here speak of the employment of the steam-engine as a motive power, or of other gases or vapours, the effects of heat derived from fuel or by other means.

THE VETERINARIAN, APRIL 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

ON CONTINUED PAPERS, AND THE ADVANTAGES OF PROFESSIONAL LITERATURE AND EDUCATION.

It affords us much pleasure to insert in the present number the first of a series of papers by Professor Brown, "On some of the Diseases of the Stomach and Intestines of the Horse, and other Animals." Thus have our expressed desires been kindly and promptly met.

We need not for a moment refer to the abilities of the author, as his writings are well known to our readers. Recently the subject of "Therapeutics" employed his pen; the practical value of which cannot have been questioned, although by too many this division of medical science is considered only of secondary importance. We hope that others will be induced to follow the example so nobly set by Mr. Brown.

The literature of a profession, like that of a country, is an index of its progress or retrogression, and we are glad to be able to point to our own as not standing still in this respect. We trust, however, that the time is not far distant when most of the so-called old authors will be thrown aside, because the statements made therein are often erroneous, and science not having progressed in their day as it has done in ours, many of the opinions inculcated by them are now obsolete. Nor do we approve of making these works appear in a new garb by, as is stated, bringing them up to the present state of science. Often with the few grains of wheat which they contain there is mixed so large an amount of chaff, so little that is good with much that is nothing worth, that the labour is rarely repaid of separating the one from the other.

We are not ignorant of the debatable nature of the subject we are commenting on, nor of its delicacy, arising from our friendship with those whose acts we are thus censoriously

criticising. But we claim for ourselves what we allow to others—liberty. And although editors are not infallible in their judgments any more than other men, we nevertheless feel convinced, knowing the abilities of the revisors, that had original works been undertaken by them instead, the profession would have been much more benefited. It is gratifying to perceive that some of our friends are of the same opinion as ourselves, and have lately acted in consonance with these views. Surely no one will attach any blame to them for altering their opinion, since it is only saying that experience has made them wiser: they know better now than they did before, and have determined to act in agreement with this acquired knowledge; to move on with the times, and to advance with the advance of mind.

It may be true that at present there is but little hope of reward for the purely scientific work in connexion with our profession; for as yet all its members do not appreciate the true worth thereof, but there will be by-and-bye. With "empty honour" for a little time its author possibly must be contented. Something better, however, is in store for him, and this will be a sufficient incentive for his continued exertion. Before him lies a field for valuable observation; and by careful culture he may obtain from it most useful results.

We are told that Bacon once made a collection of all the works on agriculture, and, after perusing them, burned them in disgust, asserting they were worthless because they contained no principles. The same might without any loss be done with nearly all the older works on farriery. In truth, the old farriers never developed a principle. If successful in the treatment of disease it was the result of chance, or at best was a repetition of what had been done before by others; and if a useful recipe was acquired by them it was kept as a profound secret, and handed down as a heir-loom in their families from generation to generation. Full oft, too, the formulæ they employed owed not their activity to the agent they supposed, since numerous substances were commonly blended together—rivalling the famous theriaca of Andromachus—and one coun-

teracted the action of the other; or, the laws of incompatibility or affinities not being understood by them, one agent decomposed the other, and a new compound was formed. Under this head it would be easy to adduce proofs, but we refrain.

The assertion is perhaps too bold, that nothing of real value was ever discovered by accident; the probability being that the beneficial effects of most substances used in the early period of medicine were thus ascertained. Indeed, we are told that the origin of this division of science may be traced as follows:

"The early subsistence of mankind was doubtlessly derived from fruits, plants, and roots; and in their search for edible products they must soon have become acquainted with many, the use of which was attended with very remarkable effects. These were noticed by them, and in all probability recorded; or, if not, their action became traditional. Thus a number of receipts, if we may so call them, were collected, which passed from man to his neighbour, and from father to son, without any attempt at system; and which, perhaps, often were employed at hazard, without any distinct reference to the symptoms of particular diseases.

"We read that it was the custom, even among such advanced nations as the Egyptians and Babylonians, to expose the sick in public places, that those who passed by might be induced to communicate the processes or medicines which had been useful to them when labouring under similar diseases. In process of time patients were taken to the temples, not only as places of public resort, but, in the expectation of assistance from the God to whom the temple was dedicated. This among the Egyptians was the famed temple of Serapis, and among the Greeks that of Æsculapius; and thus it was that the science of medicine (if such it could be then called) gradually came into the hands of the priests, who in most countries were the earliest physicians. And this did not arise exclusively from the influence of their sacerdotal character, but from their being the first to qualify themselves for the service. They saw the advantage that would ultimately result from it, since the symptoms of the various diseases, and the means resorted to for their cure, would be registered by them in their archives; and the accumulation of such cases would enable them to give advice to patients, without their exposure in public places; and the appeal to

the public would be gradually superseded. To facilitate the labour of reference, they analysed and classified the masses of facts in their possession, and thus it was that medicine was at last reduced into something like a practical system, of which the priests became the dispensers. It is by all writers agreed that the Egyptian priests were the first to bring into order the loose facts which former ages had collected; and that country was in consequence, very famous in ancient times for its medical knowledge, although, in this respect, it was ultimately surpassed by the Greeks. It was from these temple registers that the most famous physicians of antiquity derived the principles of their knowledge. It may be, that the remedies then employed, were what are usually designated *simples*, or herbs, although it is on record that chemical compounds were sometimes administered; these however, were not prepared by art, but found native."

Do we go too far when we say that it is this lack of science, this indifference to the "why and wherefore," which tends to lessen somewhat the profession in the estimation of scientific men? We cannot but think that it operates to our serious disadvantage by holding us back. Again, there is too often on the part of the practitioner, a determination not to deviate from an established routine of practice. It has answered well hitherto, is the statement made by him, then why should I alter it? Have there been no alterations elsewhere? Are there no changes being effected in the constitutions of animals?—no peculiar idiosyncrasies induced? Are the powers of animals so strong as they once where? Have not the very artificial modes of living which are now resorted to been the means of lessening the resistance offered to disease, thus rendering the body more obnoxious to its attacks? or how is it that depletive and other active measures, once so successfully resorted to, cannot now be adopted? We think, that some physical change has been the consequence of the different modes of dieting of animals, and this is to be met or counteracted only by science, and an observance of its laws. And when we say this, we must also include the changes that are likely to be produced in those vegetables, on which the majority of our patients feed, by the use of the various artificial manures. Often we have

had no difficulty in tracing the prevalence of certain diseases to them.

Lastly, to name no other cause why a love of science is not paramount with us, may be stated the fact that some persons enter the profession as a mode of "getting a living" merely, having no aptitude for acquiring scientific knowledge, nor any real love for it. Such a circumstance as this cannot fail to lesson the dignity of a profession, intimately connected as its pursuit is with that which materially contributes to the happiness of the community at large. Moreover, it is often the case that the persons we are now adverting to, have not obtained the necessary preliminary education. What has been laid down in reference to the education of the medical man may in great measure apply to the Veterinary Surgeon, since the pursuit of each is similar; differing only in degree of responsibility, arising from a difference in the value and importance of the animals entrusted to their care. Preliminary knowledge is alike indispensable in both, in order to become skilful and conscientious practitioners. The medical council of the kingdom has recently enacted that no student beginning professional study after 1861 shall be registered who has not passed an examination in arts. In order to command the respect of society and maintain the dignity of his profession, the medical man must know something more than the mere practical duties of his calling. He ought, at least, to be the equal in point of general education of his associates in society. It is scarcely necessary to remark that he ought to have an intimate knowledge of English grammar and composition, and of history, geography, and arithmetic. The study of mathematics, too, constitutes a part of the acquirements of every well-educated member of society, while at the same time it is one of the best preparations for encountering the abstruse problems of medical science. Without some knowledge of Latin and Greek, it seems impossible that the student could understand the terms which are employed in every page of medical literature, while a proficiency in at least one of the modern languages is essential to those who desire to keep pace with the progress of medical science.

It may be objected that all this has reference to the other profession, and is placing the standard too high for us. We do not think so, being convinced that it is only by education we can hope to continue to advance. A person not possessing both a love for the profession and a mind fitly cultivated for an acquirement of knowledge in connection with it, should not attempt to enter upon its study, as he can neither excel in it nor promote its progress, but, contrariwise, he will retard it. It is this which has too frequently given to the mere pretender an advantage; for quackery is as rife now as ever it was, and the ignorant man as presuming, while the public, not being themselves sufficiently taught, have been imposed upon by the designing. The means to obviate a continuance of this are simple enough—Educate, educate, educate! With the following strictures we heartily concur:

"It is humiliating to observe that, notwithstanding the wide diffusion of education, the efforts of the clergy to evangelise, and the marvellous progress of true science and its application to the arts, how the majority of the people of this highly civilised country still cling to superstitious delusions, and what a greedy ear they give to all kinds of charlatanry which appeal to their egotism and self-love, and which, at the same time, pretend to be occult or abstruse.

No system of humbug, however absurd, but has its army of devoted followers. Witness the popular delusions known as Homœpathy, Mesmerism, Palmistry, Spirit-rapping, Table-turning, divination of character from handwriting, Phrenology, &c.

Homœpathy, of all descriptions of quackery, is perhaps the most respectable, since it has its negative virtues. Simple globules of sugar-of-milk, made in bushels at a time, and distributed into little glass tubes, variously labelled 'Nux Vomica,' 'Dulcamara,' 'Rhus Toxicodendron,' &c., &c., can do no harm, but, by weaning the nervous hypochondriac from abusing the use of positive medicines may do much good, whilst the rules enjoined as to regimen, diet, and exercise, will aid nature in effecting a cure. Most of the other delusions named, are positively demoralising, and therefore injurious."

"To some the pleasure seems as great
In being cheated as to cheat."

We confess we entered upon the consideration of this subject with a degree of hesitation, amounting to reluctance; not from any apprehension that our views were incorrect, but lest, being misunderstood, we should give offence to some. Fortunately most do not come under this denomination. Our observations are, therefore, only of very partial application. There are those among us who perform the arduous duties of their profession in a true love of it. Diligence and self-sacrifice mark their course. They are also esteemed by their employers for their scientific acquirements. They obtain the guerdon, and we are proud of them, for they enhance the usefulness and importance of our art, while they promote its progress and increase its estimation by the discerning and the wise.

Extracts from British and Foreign Journals.

DIFFICULTY IN OBTAINING THE ACIDS PURE THAT ARE USED IN MARSH'S AND RIENSCH'S TESTS FOR ARSENIC.

In a paper read by Mr. Bloxam, at a late meeting of the Chemical Society, "On Arsenic in Sulphuric Acid," he stated that he had found that no samples of hydrochloric or sulphuric acid were free from this impurity. The quantity was sometimes very small, but still it would be satisfactory in medico-legal inquiries to possess an acid containing no traces of the metal. Various methods for the purification of sulphuric acid had been tried—for instance, distillation with chloride of sodium, both concentrated and dilute acid being employed; also, passing hydrochloric acid gas through a boiling solution of sulphuric acid, electrolysing, fractional distillation, distillation with oxydising agents. None of these processes, however, were successful. He next tried oxydising sulphurous acid by passing it over pumice-stone which had been coated with platinum black, but the pumice-stone itself yielded up arsenic. Nitric oxide was next employed as an oxydising agent, the sulphurous acid being prepared from sulphuric acid and copper. Mercury was employed in some of the experiments for the preparation of the sulphurous acid, on account of the arsenic present in copper. As a last resource, crystallized sulphite of soda was employed as a

source of sulphurous acid; the nitric oxide being prepared from the sulphate of iron, nitric acid, and sulphuric acid. This last process was the only one that furnished an acid free from arsenic. To discover the source of the arsenic, he obtained a specimen of sulphur from a manufacturer of acid which was guaranteed as free from arsenic. This specimen when burnt into sulphurous acid was found to contain arsenic, and even the residue left after combustion contained traces of the metal. In preparing an acid free from arsenic he had found that it was necessary to conduct the operation at as low a temperature as possible.

Dr. Frankland said it would be very satisfactory if sulphuric acid free from arsenic could be prepared in any quantity.

Mr. Dugald Campbell inquired what was the smallest amount of arsenic that could be detected by Mr. Bloxam's method, for by his own method, which would detect a very small quantity, he had found samples of sulphuric acid which were free from arsenic, but that it was always present in samples of hydrochloric acid, and that it was more important to obtain this latter acid pure. He also stated that he had found arsenic in common salt.

Mr. Bloxam said that he had distilled common salt with sulphuric acid, and had found arsenic in the distillate, but that he obtained none from chloride of ammonium and sulphuric acid.

LIVE STOCK, &c., IN TASMANIA.

From an interesting paper, abounding in statistical information, read by Dr. Milligan before the *Society of Arts*, we extract the following:

"Horses sheep, cattle, and pigs were exported from Tasmania to the value of £60,900 in 1859.

"The feats of Tasmanian horses on the turf early established for the colony the reputation of possessing the best blood and bone in the Southern Hemisphere. The late governor, Sir W. Denison, was a warm patron of the turf, and frequently went out with the hounds, proving himself as fearless as firm in the saddle. The gold of Victoria has now effected a transfer of much of the horseflesh of Tasmania to the opposite shores.

"The breeds of cattle which have been introduced into the colony are the Durham or Short-horn, the Hereford, the Ayrshire, the West Highland, and the Devon. These have all, at one time or other, and to a greater or less extent, been

crossed with an original, coarse, Long-horned variety, betraying Indian lineage or connexion, and derived probably from New South Wales, in the very earliest times of the colony. The Durham is the favourite breed, but it carries a frame and carcase too large for the natural pastures, save in exceptional localities, and it is too delicate in constitution; the Ayrshire maintains in the colony its high reputation as a milch cow; but the Devon is by far the best adapted in frame, constitution, and kindly feeding properties, for the natural pastures of the island, and it is decidedly a comely animal. The kyloe, or West Highland breed, promises to yield a cross extremely well-suited for the wild, warm, and humid feeding-grounds to the westward. The number of horned cattle in the island in 1859, appears by Government tables, to have been 79,950. Pigs are extensively cultivated by farmers of every degree. In the early times of the colony a few were allowed to run wild in the bush, where they lived chiefly on fern roots; they have long since been extirpated. The number in the colony, as per statistical return for 1859, was 32,008."

"The turnip crop is quite as hazardous in Tasmania as in England, but of far less critical importance to the farmer, live-stock being by no means so dependent on housing and artificial food there as they are in England during the winter season. Mangold-wurtzel and carrots are both well suited to many Tasmanian soils, but are not much grown.

English grasses are cultivated rather extensively for hay, and yield a fair return. As provender for horses it is always in demand for domestic consumption, and for the Melbourne market. The price in Hobart Town in December, 1860, was £4 and £6 per ton.

Butter and cheese were exported in the year 1859 to the value of £13,877. The dairy is rising in estimation among farmers as a source of profit; and the butter and cheese of Tasmania has acquired a high character in the neighbouring colonies. The last quotations at Hobart Town (23rd January) give for fresh butter 1*s.* 3*d.* to 1*s.* 6*d.*, and for cheese 1*s.* 6*d.* to 1*s.* 9*d.*"

Wool, which in the early times of the colony was permitted, it is said, to rot in heaps on the premises of the settlers, and which from its coarse and low character at the time scarcely deserved a better fate, has been so highly improved in later times, and increased in quantity so immensely, as to have long occupied the place of the principal export and mainstay of the colony. This important end has been attained through repeated and long continued crosses with the sheep (both ewes and rams), selected from the finest Merinos

and Saxon flocks in Europe by enterprising colonists, and by the agents of the Van Diemen's Land Company, the purity and excellence of whose live stock of every description long maintained a high character, and fetched the highest prices. The capabilities and suitability of Tasmania for the production of wool of the finest fibre and highest value for the purposes of the manufacturer is well known. The high prices commanded in the English market by wool from the flocks of Messrs. Kermode, Smith, Maclanachan, &c., practically attest the fact. Its character was acknowledged to be of the highest order at the London Exhibition of 1851, and at Paris in 1855. The capacity of the island for maintaining a much larger number of sheep than are at present depastured there can scarcely be doubted. For a long time sheep-owners in Tasmania cultivated fineness and softness of fibre exclusively, and the result was a delicate animal and comparatively light carcase, but a change took place with the rise in the value of animal food, and for many years past it has been the aim of flock-owners to combine length of staple with fineness of fibre to the utmost extent which they can command, a course by which they obtain a much heavier fleece, and a larger and probably hardier animal. With this view the highly improved Merinos have been crossed with the Leicester, New Leicester, and South Down breeds, &c., and in many instances with great success. From the statistical tables published by governments are extracted the following return of sheep depastured in the colony, and of the value of wool exported therefrom in the years mentioned. In 1823 wool was exported to the extent of about 1000 bales. In the year

	No. of Sheep.	*Value of Wool.*
1839	898,590	£194,647
1844	1,145,089	176,269
1849	1,712,291	202,334
1854	1,831,308	325,384
1859	1,697,199	467,968

There appears to have been a falling off in the number of sheep in the colony since 1854, but on closely examining the returns I find the weight of wool exported in 1854 stated to have been 4,419,276 lbs., while in 1859 it was 6,107,903, and as there is a nearly corresponding difference in the value, it may be concluded that small sheep of short wool and light fleece, had been replaced to some extent with sheep of larger frame and longer and heavier wool. Upon artificial pastures, along the north and north-west coast, where the climate is humid as well as warm, the Leicesters attain a size and

weight little short of the prize animals exhibited at cattle-shows in England, but they are not calculated to thrive on the comparatively thin natural pasturage. The Cheviots have been introduced, and, as might have been expected, are found to thrive prodigiously and to increase rapidly, but it is a questionable proceeding which would replace the Merino crossed with Leicester blood, yielding a fleece of fine wool of rather long staple, for a breed which, however harder, is remarkable for the vulgarity of quality in the wool throughout its fleece, and which scarcely bears a fleece heavier than that of the animal it supersedes.

"The amount of increase realised from breeding flocks in Tasmania is dependent to a great extent upon the condition (as to flesh) and health of the ewes, upon the nature of the pastures as to the abundance of grass, or the reverse, and upon the nature of the weather at that critical season. On good, well-sheltered pastures, with ewes in fair condition, I have often seen upwards of 100 per cent. saved; if at any time the yield falls much below 80 per cent., there is ground for suspecting some mismanagement; if it falls below 40 per cent., gross defects of management must have existed. One of the most ordinary causes of failure of increase in sheep husbandry is the very prevalent custom of over working the grazing, so as to produce an unnatural delicacy of constitution in the stock.

"Sheep farming, from the earliest times of the Australian settlements as the resort of free colonists, has been regarded as the most profitable mode of investing capital. In flocks where there is a fair proportion of breeding ewes of wethers and other dry sheep, the clip of wool is considered to be more than sufficient to defray all charges of management, and the value of the annual increase becomes the net measure of profit accruing. There have occurred some singular vicissitudes in the value of sheep in the Australian colonies. In 1809, prices were very high, in consequence of a large exportation for two or three years to the new colony of Port Philip, but in 1843 sheep were selling at 2*s.* 6*d.*, per head in that settlement, and at the same time fetching very low prices in Tasmania. The boiling-down process was discovered, and immediately prices assumed a comparatively high figure, and small capitalists who had purchased extensively at the previous extremely low rates, found themselves suddenly converted into men of large fortune. Many Tasmanian settlers became at that period large proprietors of sheep in Victoria, and were proportionately enriched."

The wheat of Tasmania, according to analysis by Mr.

Wentworth L. Scott, possesses more than the average proportion of nitrogen, fat, phosphoric acid, and the alkalies. Its cultivation, says Dr. Milligan, admits of almost boundless extension, every probability being in favour of the opinion that the yet uncultivated portion of the colony contains lands of the richest character, and that as these are brought under tillage, a very much higher average yield of wheat will be obtained, altogether independently of increment from improved modes of culture.

REPORT ON THE EMPLOYMENT OF A FRENCH REMEDY FOR THE CURE OF ROT IN SHEEP.

Presented to the Royal Agricultural Society

By Professor J. B. Simonds.

It will be remembered that in the early part of the year M. Trehonnais called the attention of the agricultural community to a remedy employed in some parts of France for the rot in sheep, which was much extolled for its curative properties, and that the council, on the recommendation of the veterinary committee, resolved to purchase some sheep for experiment, and voted a sum of £12 for the purpose, M. Trehonnais having very liberally engaged to obtain a sufficient quantity of the agent for trial in this country.

In accordance with this resolution, instructions were given me to procure such animals as I deemed fitting for the purpose, and to commence the experiment as early as circumstances would permit. In selecting the sheep, which were of the improved Dorset breed, I took care that they should be of the same age as near as possible, be also in a condition warranting the belief that they would survive long enough to give a fair trial to the medicine, but be in different stages of the malady. I preferred one-year-old sheep, as offering most of these advantages, and for the further reason that an approximation could be made as to the time they had been the subjects of the malady. Everything being arranged, the experiment was commenced on April 22nd, the first thing done being to divide the sheep into two parts, leaving one moiety at the Royal Veterinary College and sending the other to my farm, Oakington, in the parish of Harrow. This proceeding was deemed important, as each division would be placed under totally different circumstances as to the

kind of food which would be supplied to the animals, and the protection which would be afforded them.

The sheep left at the College were kept entirely on hay and oats, housed every night in a shed, but allowed the use of a small enclosure during the day. Those sent to Oakington were on the contrary placed in a meadow, with an abundant supply of grass, had no corn, nor any protection of a night, save when the weather was wet.

I further determined to give the medicine to *three sheep only* of each lot, leaving the others entirely to their chance. In doing this I selected the apparently strongest sheep for taking the medicine.

The directions received from France for the use of the agent were that a tablespoonful should be given to each sheep every morning, half an hour before feeding time, and be continued from fifteen to twenty days to animals in the early stages of the disease, and from thirty to forty days to those in the advanced or latter stages, or even for a longer time in very severe cases. It was further ordered that as soon as the animals had gained their appetite and strength, whatever other indications of the disease might exist, no more medicine should be given, as these were signs of convalescence—proper care as to feeding and management sufficing to complete the cure. Under the influence of regimen, care and exhibition of the medicine, it was also stated that a cure would be effected in a month or six weeks of the sheep in the early stages of the disease, and in about three months of those in the advanced stages. The recoveries were said to be *all* in the first, and *two thirds* in the latter stages.

The exhibition of the medicine for the first fortnight appeared in neither lot to have any marked effect, the animals, with one exception, continuing in their original condition. In the case alluded to, and which was one of the sheep kept at the College, the disease was evidently fast gaining ground, foretelling a fatal result. This was also one of the animals to which the medicine was administered. On the twenty-first day from the commencement of the experiment it died, and on being examined post mortem it was found that numerous flukes existed in the liver, that the organ was pale in colour and had undergone structural changes, that effusion of serum had taken place into the abdominal cavity, and that the entire flesh was flaccid and paler in colour than natural from general anæmia—thus proving the true nature of the malady. Under these circumstances, I resolved to select one other of the three animals which up to this time had had no medicine, as the trial

did not appear quite satisfactory in the case alluded to, death having resulted so soon.

Continuing the report of the College sheep, it is next to be observed that the remedy was continued to the middle of June, and this, not only without any apparent benefit, but seemingly with some disadvantage, as these three sheep were more emaciated than the other two.

This untoward circumstance evidently depended on the nauseating effects of the medicine, as the animals would often refuse their food after its exhibition, and sometimes even till the latter part of the day.

It may be here remarked that the medicine contained some oleaginous material which had a very unpleasant smell, not unlike fetid animal oil, and which had probably to do with its sickening effects.

On the 20th June, being two months from its first exhibition, the medicine was discontinued to the College sheep. All the animals were kept, however, about six weeks longer, by which time they had become so emaciated that it was determined to destroy them, which was accordingly done. A post-mortem examination was made of each, and it was found that no real differences existed in the lesions wrought by the disease in the sheep which had taken the medicine from those of the others which had not. Living flukes existed in large numbers in the livers of all the animals.

To return to the sheep at Oakington. It has been already stated that for the first fortnight subsequently to April 22nd no material alteration had taken place in this moiety of the animals. By the end of May, however, it was very evident that three of the sheep were gaining flesh, and presenting a far more healthy appearance than the others. Two of these were sheep not taking medicine, and one which was. The other three were wasting, and becoming day by day more debilitated; but, nevertheless, when compared with the sheep at the College, they were in far better condition.

On June 6th, forty-five days after the commencement of the experiment, one of the animals died, and this, as in the instance at the College, was one which had taken the medicine. The lesions met with on examination of the body agreed with those already described, and need not, therefore, to be repeated. The medicine was continued with the other two—up to the 20th of the same month with one, and for a fortnight longer with the other; the latter being an emaciated and gradually declining animal. The three sheep spoken of as doing well were by this time so much improved that I had no apprehension of their death. The weather was dry and

the herbage of the pasture good—circumstances most favorable for their recovery. All were kept throughout July, and until the 4th of August, when I determined, as it was evident two would ultimately sink, to kill three of the entire lot, viz., the two in question and one of those which had greatly improved in condition, and which had had no medicine throughout. My chief reason in taking the resolve with reference to the latter-named animal was to ascertain on what its improved state depended, or whether, in fact, it was the subject of the entozoic disease—rot. On making the post-mortem examination of this animal it was found that only a few flukes were present in its liver, and that the structure of the gland was but little changed—facts which fully accounted for its well doing.

With reference to the two remaining sheep, one of which, it will be remembered, took the medicine and the other not, I feel assured that their improvement is due entirely to the same cause. I have further to report, however, respecting these sheep, that being ewes, I placed them with my breeding flock at the time of putting the rams to the animals, and intend to keep them throughout the winter to mark the result, giving them no more attention as to feeding and management than the flock will receive.

On reviewing all the details of this experiment, I fear we must conclude that this supposed cure of rot in sheep has proved quite ineffective for good in our experience.

INVESTIGATIONS ON HYDROPHOBIA IN DIFFERENT PARTS OF EUROPE, ESPECIALLY IN UPPER ITALY.

By M. Boudin.

The geographical study of rabies furnishes powerful arguments against the spontaneous origin of the disease. In 1856 there were 75,446 dogs in the Department of the Seine, and in 1857 the number had only fallen to 64,408. In France there are two cases of rabies out of every million of inhabitants. At the veterinary school of Alfort 42 rabid dogs were received in 1856, only twelve in 1857, and as many as 56 in 1858. Out of 239 cases of rabies recorded in France there were 157 men and 64 women; out of 228 persons bitten in France 188 were bitten by dogs, 26 by wolves, 13 by cats, and 1 by a fox.

Respecting the seasons of the year, it has been found, by

returns lately published in France, that out of 181 cases of rabies in human beings, 40 were recorded in December, January, and February; 44 in March, April, and May; 66 in June, July, and August; and 31 in September, October, and November. Out of 147 cases of rabies noted in France, the period of incubation was, in 26 cases, less than one month; in 93 cases, from one to three months; in 19 cases, from three to six months; and, in 9 cases, from six to twelve months. Out of 161 cases observed in France, the duration of confirmed rabies was not more than two days in 34 cases; four days in 98 cases; six days in 24 cases; seven days in two cases; eight days in 1 case; and nine days in 1 case. In England and Wales the deaths from rabies were 25 in 1851, 15 in 1852, 11 in 1853, 16 in 1854, 14 in 1855, 5 in 1856, 3 in 1857, and 2 in 1858. In Prussia the deaths from the same cause were 20 in 1844, 15 in 1845, and 28 in 1846. In the Austrian empire the deaths from rabies were 589 from 1830 to 1838, and 449 from 1839 to 1847. In Bavaria there were 39 from 1844 to 1850. In 1851 the disease reigned epidemically in the north of Germany; at that period no less than 267 cases of rabies were observed in dogs at Hamburg and its vicinity. From 1829 to 1854, 35 patients suffering from rabies were received into the Great Hospital at Milan (19 males and 16 females). In 1832, '33, '36, '39, '47, and '50, no cases of rabies were received in that hospital; but 5 were admitted in 1849, 4 in 1838, 4 in 1854, 3 in 1851, and 2 in 1830, '35, '37, and '48. In the other years only 1 case was admitted. Out of these 35 patients, 17 were less than fifteen years old—an enormous proportion, which is probably the result of the habit of children playing with animals. In none of these 35 patients did the symptoms appear before the fifteenth day, and with one of them the incubation was from 170 to 175 days. With none of these patients did death occur before the twenty-fifth hour after the appearance of the first symptoms. The author himself, however, saw a case of rabies at the hospital of Versailles, in 1846, where the patient died two hours after the disease had appeared. From other figures mentioned by the author, it is proved that neither the muzzling of dogs nor the cold season of the year supplies a safeguard against the rabid bites of these animals.

The author has also arrived at the following conclusions:—1. We may estimate the number of dogs in Europe at more than twelve millions, and the cost of their keep at a million francs per diem, or half a milliard per annum. The annual number of victims amounts to several hundreds. 2. In the

immense majority of cases rabies is propagated by the bite of the mad animal, although sometimes it appears to have been transmitted by licking the skin, when more or less excoriated. 3. The perusal of the innumerable documents which have been published on the subject does not reveal a single fact capable of furnishing serious scientific proof of the occurrence of spontaneous rabies canina. 4. Even if this spontaneous occurrence ever did take place, it would do so with such rarity, that it would scarcely be necessary to take it into consideration in framing measures of sanitary police. 5. The old hypothesis, recently revived, which attributes rabies to unsatisfied genetic instinct, does not bear the slightest examination. 6. The influence attributed to the temperature and humidity of the air on the frequency of rabies is contradicted by facts. 7. The pretended rabid epizootics described by authors are only multiple instances of communicated rabies; and the term epizootic, in this case, should be excluded from the language of science. 8. We are in the possession of no positive data as to the extreme limits of the period of incubation of rabies in man. In the dog it would seem to last seven months (Youatt), and in the horse fourteen months and a half. 9. No true pathognomonic sign of rabies exists in the dog, hydrophobia, properly so called, seeming to be here quite at fault. The peculiar howling bark is of great value in the diagnosis. 10. Science is in possession of nothing certain regarding the alimentary nocuity or innocuity of the flesh of mad animals, or of the milk of cows and goats bitten by mad animals. 11. With respect to the measures of public hygiene and administrative police—(*a*) The tax on dogs has had the effect of diminishing their number, and so far the chances of the occurrence of rabies and hydrophobia. (*b*) As rabies may manifest itself throughout the year, the surveillance of dogs should never be suspended, and they should always be kept muzzled. (*c*) As bites have been often inflicted by muzzled dogs (20 times in 156) the proper application of the muzzle should be strictly seen to by the police. (*d*) Dogs which have been bitten by dogs that are either mad or suspected of being so, when not immediately killed, should be sequestered for a period at least equal to the known maximum of duration of the period of incubation.—*Union Médicale*, No. 136. [M. Fauvel, the French sanitary officer at Constantinople, stated at one of the French medical societies (*Gaz. Hebdom.*, No. 45) that hydrophobia, although a very rare disease in the East, is yet occasionally met with in Constantinople, some seven or eight cases having occurred there of late years. According to the

popular opinion there, rabies only occurs among the domesticated dogs, while the wandering dogs, which are numbered by thousands in that city, never become the subjects of the disease.]—*Lancet and Medical Times.*

PETROLEUM SPRINGS IN NORTH AMERICA.

Dr. A. Gesner states that 50,000 gallons of mineral oil are daily raised from these springs for home use and exportation.

The oil-region comprises parts of Lower and Upper Canada, Ohio, Pennsylvania, Kentucky, Virginia, Tennessee, Arkansas, Texas, New Mexico, and California. It reaches from the 65th to the 128th degree of longitude west of Greenwich. The latest account of those in Canada states that they are continuing to yield abundantly, and, contrary to theories at first propounded, the deeper the wells are sunk the better the yield and the richer the oil. The extent of surface embraced in the oil districts is much larger than was at first anticipated. Villages are rapidly springing up, refineries are being built, and roads constructed. Many large establishments throughout the country are using rock oil in place of gas, and find it much cheaper, and in some instances it gives a better light.

FACTS AND FALLACIES CONNECTED WITH THE RESEARCH FOR ARSENIC AND ANTIMONY; WITH SUGGESTIONS FOR A METHOD OF SEPARATING THESE POISONS FROM ORGANIC MATTER.

By Alfred S. Taylor, M.D., F.R.S.

(*Concluded from vol.* xxxiv, *p.* 679.)

8. *Metals and metallic salts.*—The detection of arsenic in such metals as copper, iron, or lead, is effected by distillation with hydrochloric acid, after their conversion to chlorides. This method has been already fully described in reference to copper (p. 413). In July and August, 1859, I first employed it for the detection of arsenic in sulphate and insoluble oxychloride and arsenite of copper, as well as in chloride of tin, the subnitrate of bismuth, and gray powder. In ten grains of the sulphate of copper supplied from the shop of a medical prac-

titioner arsenic was found. It was detected in some of the green incrustation derived from the action of chloride of sodium on metallic copper, showing that, in some forms of cupreous poisoning arsenic is certainly present. Scheele's green, in all its varieties, whether on paper-hangings or in confectionery, yields arsenic by distillation in great abundance. Out of five samples of bismuth supplied by respectable druggists, arsenic was found in three; and out of as many samples of gray powder, arsenic was found, and that only doubtfully, in one.

I have lately employed this process on a large scale, in the examination of the viscera of three persons whose bodies were exhumed after from six to nine months' burial, and of the viscera of two persons recently deceased. The results were negative for arsenic. Antimony was found in four of the bodies; but no trace of this metal was procurable by distillation with hydrochloric acid. When large quantities of viscera are used, a capacious retort or flask must be employed. Arsenic, when present in large quantity, may be obtained by the distillation of viscera in their ordinary state with strong hydrochloric acid. I find, however, that it is much better to reduce the bulk and expel the water by drying the substance cut in slices, and by exposing them to a free current of air. The operator can then not only deal conveniently with more matter in one analysis, but he is more certain of obtaining the arsenic in the form of pure chloride in the distillate. The dried viscera, finely cut up, should be allowed to digest for a few hours without heat in the closed retort or flask in which they are to be distilled. This breaks up the structure, and renders distillation easy. It will be understood in the application of this process that it may be sometimes necessary to re-distil the distillate, if coloured, in order to separate organic matter; and at other times, the residue in the retort may require a second distillation with strong hydrochloric acid. In all cases, the residue in the retort should be tested by Reinsch's process, in order to determine whether any arsenic is retained in it. By adding to one portion of the residue, chlorate of potash and a little hydrochloric acid, and boiling the mixture, the organic matter may be destroyed; any arsenic converted to arseniate of potash, and the clear filtered liquid tested by Marsh's process.

In the distillation of recent and undried viscera, most offensive products, including sulphur-compounds, are evolved. These are decomposed if the distillate is kept for a few days, and sulphur is deposited. If tested immediately with the hydrogen apparatus, sulphuretted hydrogen is evolved. This may be stopped by a salt of lead, in the manner already

described at p. 541. If the hydrogen compounds of sulphur and arsenic pass over together, the application of a red heat leads to the production of an orange-yellow sulphide of arsenic at the end of the metallic deposit. Sulphur alone can never be mistaken for metallic arsenic. Its yellow colour, its property of readily melting, and the absence of any solid product as a result of the action of nitric acid—are characters which will prevent any mistake on this ground.

Novelty of the process.—The reader will have perceived from the foregoing remarks that the process here recommended has no pretensions to novelty. It consists simply in the associatiob or arrangement of the well-known chemical properties of arsenic so as to render them more easily demonstrable than they have hitherto been. The processes of Marsh and Reinsch have been introduced in a form less objectionable than that in which they were left by their discoverers.

The chloride of arsenic has been long known as a volatile compound. Berzelius, and chemical writers subsequently to him describe its properties, and refer chiefly to one method of preparing it; namely, by distilling at a high temperature a mixture of arsenious acid and corrosive sublimate. In 1841 Dupasquier found that arsenious acid was very soluble in hydrochloric acid, and he considered the solution to contain chloride of arsenic. When submitted to distillation, he found the distilled product to be arseniferous.[1] Dr. Pereira states that on repeating the experiment he found the quantity of arsenic which distilled over was very small, and that the residual liquor in the retort deposited octahedral crystals of arsenious acid.

In employing Reinsch's process in various analyses for arsenic in the dead body, during the years 1846-7, I found that there was a loss of arsenic; and the following passage in reference to this subject occurs in the first edition of my work 'On Poisons:'—"The boiling of the tissues in muriatic acid for the extraction of arsenic should take place in a *close vessel*, such as an alembic or a capacious retort with a receiver attached to it. There is, beyond all doubt, a loss of arsenic when this precaution is not adopted. In May, 1847, the following experiment was performed in order to determine this point. Four grains of arsenious acid were dissolved in five ounces of distilled water, to which five drachms of concentrated muriatic acid had been previously added. The vessel was so large as to prevent the possibility of any liquid being carried over *mechanically*.

[1] Quoted by Pereira from 'Journal de Pharmacie,' tome xxvii, p. 717, 1841. Pereira, 'Elements of Materia Medica,' &c., by Taylor and Rees, 1854, p. 720.

The boiling was continued for two hours, when nearly one half of the liquid had been collected iu the receiver. This was found to contain arsenic on applying Reinsch's process."[1]

I have at intervals since this time continued the practice of boiling the tissues in a retort and analysing the distillate, whenever a suspicion existed that arsenic was present, but in very small quantity; and when Reinsch's process did not at once indicate the presence of the poison.

The fact, therefore, that arsenic could be procured from the tissues by distillation with hydrochloric acid, has been known and acted on for the last fourteen years. The facilities presented by Reinsch's process had rendered it unnecessary to resort to distillation in most cases, as the presence of organic matter did not interfere with its operation.

In 1849-50 I find, from notes in my possession, that my friend and colleague, the late Mr. Arthur Aikin, laid before the classes of Guy's Hospital, and demonstrated, the method of procuring chloride of arsenic by the use of salt and sulphuric acid. The note is to the following effect:

"If one part, by weight, of arsenious acid, three parts of common salt, and four parts of strong sulphuric acid, are mixed and distilled, there comes over a thick, oily liquid, formerly called butter or oil of arsenic, which is hydrated terchloride ($As\,Cl_3 + 3HO$)."—*MSS. Lectures.* In 1851-2, Dr. Schneider proposed a mixture of salt and sulphuric acid for procuring arsenic from organic matter, and it succeeded more perfectly than he had anticipated, considering that the anhydrous chloride of arsenic does not boil under 270°.[2]

Schneider advises that the salt and acid should be accurately tested before use, so as to ascertain that they are free from arsenic. He gives a number of minute precautions, and a form of apparatus, for an account of which I must refer the reader to his work. The common salt should always be in large excess, in order to prevent the production of sulphurous acid by a reaction towards the close of the distillation, between the organic matter and sulphuric acid. He found that when arsenious acid was dissolved in a large excess of hydrochloric acid and distilled, the whole of the arsenic went over as the chloride, mixed with the vapour of the acid; not a trace of arsenic remained in the retort. Thus he found it impossible to purify by distillation hydrochloric acid rendered impure by

[1] 'On Poisons in relation to Medical Jurisprudence and Medicine,' 1st edition, 1848, p. 363.

[2] 'Die Gerichtliche Chemie für Gerichtsärtze und Juristen,' bearbeitet von Dr. F. C. Schneider, Docenten der Chemie an der Wiener Universität. Vienna, 1852, pp. 193, 206.

arsenic, or even liquids of which hydrochloric acid was a large constituent. He pointed out the fact, that in most researches for arsenic, the volatile chloride may be produced; and if in small quantity, the poison may be entirely lost, and a negative result obtained, when with greater care, the presence of the poison would have been detected.[1]

Having given to this method a fair trial, I find it far inferior to that which I have above recommended. In mixing the salt and acid there is great frothing, with a large escape of vapour. In some cases in which pure hydrochloric acid operates effectually, this process will not detect arsenic. This occurs in reference to arsenic in metallic copper, and in certain metallic salts. Schneider states, that the sulphide of arsenic is readily converted to the chloride by this process, provided a larger quantity of salt and acid is used, and the distillation maintained for a longer time. The further steps of the process, as described by Schneider, are as follows:—The distillate containing chloride of arsenic is placed in a Marsh's tube; the resulting gas is decomposed by heat, so as to produce an arsenical mirror, and another portion is allowed to pass into a solution of nitrate of silver, in order to procure a solution of arsenious acid, to which the usual tests may be applied.

As a result of some recent investigations, it has been found that an excess of sulphuric acid prevents the formation of chloride of arsenic. In fact, the chloride, when treated with concentrated sulphuric acid, is decomposed into hydrochloric and arsenious acids, the latter of which remains behind in the retort.[2] Hence, unless care be taken respecting the proportions used, the object of the process will be entirely defeated. On one point the results of my experiments are quite in accordance with those of Schneider. If the distillation is carefully and properly conducted, and carried on for a sufficient time, the whole of the arsenic contained in the organic matter will be transferred to the distillate.[3]

Schneider's process has been largely employed in Germany, but it has been little used in this country. A description of it was published in the *Pharmaceutical Journal* for July, 1853, p. 38. About this date Dr. Clark, of Aberdeen, took up the subject, and, as I am informed, employed the process successfully in some medico-legal investigations for arsenic. In the fifth edition of my 'Medical Jurisprudence,' 1854, I briefly referred to it, stating that the arsenic contained in organic liquids or solids might be procured as chloride, in a receiver,

[1] Op. cit., p. 194.
[2] 'Archiv. der Pharm.,' and 'Chemical News,' June 23rd, 1860, p. 24.
[3] Op. cit., p. 207.

by distilling the organic matter with a mixture of common salt and sulphuric acid; and, further, that the chloride of arsenic thus obtained in a pure state might be subsequently analysed by any of the usual processes.

According to Dr. Christison, the process of extracting arsenic by distilling the viscera with hydrochloric acid was employed by Dr. Penny, of Glasgow, in 1852. In the case of Madeleine Smith (1857), both Dr. Christison and Dr. Penny obtained arsenic by the distillation of the viscera of the deceased L'Angelier with hydrochloric acid—the one from the liver, and the other from the fluid contents of the stomach. Dr. Christison's mode of operating is thus described in his evidence:—"About four ounces of the liver were subjected to a modification, proposed in 1852 by Dr. Penny, of the process of Reinsch for detecting arsenic in such matter. The liver having been cut into small pieces, and boiled in hydrochloric acid and distilled water, in a glass flask, to which a distilling apparatus of glass was connected, the whole texture was gradually reduced to a fine pulp, and a distilled liquor was obtained which was collected in divided portions. These liquors were colourless and nearly clear. The first two portions obtained did not contain any arsenic;[1] the third gave faint traces of it; the fifth and sixth portions, when separately subjected to the action of copper-gauze, gave characteristically the usual dark gray incrustation, and this again was driven off as usual by heat in a small glass tube, and yielded in each case a white, sparkling ring of crystals, which were regular octaedres, or forms derived from the octaedre. The liver, therefore, contained arsenic."[2] Dr. Penny states —"A fourth portion of the prepared fluid (contents of the stomach) being properly acidified with hydrochloric acid, was distilled, and the distillate subjected to Fleitman's process. For this purpose it was boiled with zinc and a strong solution of caustic potash. Arseniuretted hydrogen was disengaged, and was recognised by its odour as well as by its characteristic action on nitrate of silver."[3]

It appears that, in the above cases, the acid employed in the distillation was used in a diluted state, as it was employed by

[1] No chloride was produced until some water had been expelled.

[2] Irvine's 'Report of the Trial of Madeleine Smith,' 1857, p. 61. It would thus appear that the use of Reinsch's process with copper-gauze untested in its substance for arsenic, was employed by this excellent chemist and toxologist up to the summer of 1857 for the detection of arsenic in a liver, in a case of alleged murder by poison, and with perfect safety as to the results.

[3] Op. cit., p. 54.

myself in 1846-7. This was, no doubt, the cause of the arsenic not coming over entirely. Dr. Christison simply applied Reinsch's process to the distillate; and Dr. Penny, although he might have obtained arseniuretted hydrogen by the use of zinc alone, added a strong solution of potash. The only tests to which the gas thus procured was submitted were the peculiar odour and the action of nitrate of silver.

In the 'Guy's Hospital Reports' for 1855,[1] Dr. Odling has published the account of an experiment which, at the suggestion of the late Mr. Scanlan, he performed on the stomach of a dog. He distilled it to dryness with hydrochloric acid. Arsenic was very abundantly detected in the distillate, and the residuum was not by any means free from the poison. Altogether, the process did not present any advantages to compensate for the increased trouble attending it. Subsequent experience has, however, satisfied him that he had here undervalued this method of separating arsenic.

This I believe, comprises all that is recorded in English medical literature, or that has been done by English chemists in reference to the method of separating arsenic by hydrochloric acid, up the summer of 1859, It was at this time that the objections taken to Reinsch's process induced me to revise the facts already known regarding the action of hydrochloric acid on arsenic, and the conditions under which the acid might be used for the separation of this poison from organic matter. During the last twelve months I have made many experiments on this subject, the results of which are here given. In addition to the other well-known properties of arseniuretted hydrogen, for which science is indebted to the researches of Gay Lussac and Soubeiran, I have found that the use of strong nitric acid for oxidizing the gas is a useful addition to this branch of medico-legal research, a fact which appears to have been hitherto overlooked.

PROCESS FOR ANTIMONY.

I have little to say on this subject; for nearly all that can be said is comprised in the following remarks.

For the detection in, and the separation of antimony from, the *tissues*, the best plan, according to my experiments, is that which was originally suggested by Reinsch, in 1841. The

[1] Third series, vol. i, p. 293, 1855. In the last volume of these 'Reports,' for October, 1859, the experiment is again referred to at pp. 370 and 371, but by a typographical error the year is set down in both references as 1851 instead of 1855.

antimonial compounds, when distilled with hydrochloric acid, do not readily pass over into the receiver. They are much more fixed than those of arsenic.

In the examination of the tissues of persons poisoned by antimony, I have not been able to procure by distillation with hydrochloric acid any trace of the metal in the distillate, although antimony was readily found by Reinsch's process in the residue in the retort. If this fact should be corroborated by future inquirers, the distillation-process will furnish a ready method of separating absorbed arsenic from absorbed antimony.

In reference to the distillation of the saline compounds of antimony, I have found that, contrary to what might be expected, the metal passes over more readily into the distillate when the acid is mixed with water, than when it is concentrated, but even in this case the quantity thus obtained by distillation is very small.

Experiment 1.—One grain of tartar-emetic was dissolved in two ounces of water; three drachms of strong hydrochloric acid were added. The mixture was distilled to dryness. One third of the acid distillate gave no indication of antimony by passing into it a current of sulphuretted hydrogen gas. The other two thirds gave violet deposits on copper, coating about one quarter of a square inch of foil on both sides. It was ascertained that the greater part of the antimony still remained in the dry residue in the retort, the heat not having been sufficient to carry over the chloride.

Experiment 2.—One grain of tartar-emetic was dissolved in two drachms of pure and concentrated hydrochloric acid and distilled to dryness. The acid distillate yielded a mere trace of antimony, by Reinsch's process—not exceeding the 1-4000th part of a grain. The residue in the retort gave an abundant white precipitate of oxychloride of antimony on the addition of water. This was immediately dissolved by a solution of tartaric acid, and the antimony subsequently precipitated, as an orange-red sulphide, by passing into it a current of sulphuretted hydrogen gas. It is worthy of remark that *arsenic* passes over most readily with the strong acid; hence, if viscera are suspected to contain deposited arsenic and antimony, the arsenic may be obtained by distillation, and the antimony separated from the organic matter in the residue, by Reinsch's process. The method of proceeding for antimony is, therefore, as follows:

1. Boil the viscera, in a finely divided state, in one part of pure hydrochloric acid and from four to six parts of water. Boil in a flask or retort, and condense by a funnel the acid

vapour as it issues. Introduce slips of polished copper-foil (free from antimony). Continue the boiling for at least two hours before concluding on a negative result. In certain cases it may be necessary to employ from twelve to sixteen ounces of organic matter in one operation.[1]

2. Wash in water the pieces of copper when coated, and observe the violet or steel-gray film, according to the thickness of the metallic deposit (see page 99).

3. Boil as many of the coated pieces of copper as can be collected, in a solution of pure potash, in a test-tube, occasionally exposing the coated surfaces to the air. The antimony is oxidized and dissolved off by the potash.

4. Filter the potash-solution; acidulate with pure hydrochloric acid, and pass into the liquid a current of sulphuretted hydrogen gas. An orange-red sulphide of antimony is precipitated.

5. Filter the liquid and wash the precipitate. Add a few drops of solution of ammonia, and note its insolubility in this liquid. Any sulphide of arsenic is dissolved, carried through the filter, and may be found in the filtrate.

6. Again wash the sulphide, and then dissolve the precipitate in pure hydrochloric acid, taking care to boil the liquid, in order to set free all the sulphur as sulphuretted hydrogen.

7. Having mounted a tube-apparatus for hydrogen, as described under arsenic (see page 541), pour the solution of chloride through the funnel into the tube.

8. Test the gas evolved at the capillary end of the tube by a solution of nitrate of silver, and if the solution is blackened decompose the gas by applying a red heat to the tube. Remove the tube with the metallic deposit, and gently heat it to see whether octahedral crystals are obtained; or whether, at a higher temperature, it simply forms a white amorphous oxide.

The antimoniuretted hydrogen may be in sufficient quantity to be collected in strong nitric acid. In this case the nitric acid, after saturation, should be evaporated and tested, as already described (see page 544).

Instead of decomposing the chloride by zinc, the operator may dilute it until the water forms one tenth part, and plunge into it a slip of pure tin, free from arsenic or antimony. If, as Millon and Laveran have shown, the liquid contains antimony, even in minute traces, the surface of the tin will be sooner or

[1] In one of the recent cases of antimonial poisoning at Liverpool, Dr. Edwards found it necessary to use thirty ounces of the liver, and to boil the liquid for several hours before he obtained a clear antimonial deposit on the copper-foil.

later coated with a fine, black, pulverent deposit of metallic antimony. Arsenic is not thus deposited, or there is only a slight discoloration of the tin, after some days. In the absence of antimony, the surface of the tin, after several days, presents merely a crystalline appearance.

The process above described is sufficiently delicate for all practical purposes. As a proof of this, I may mention that it enabled Dr. Miller, Dr. Edwards, of Liverpool, and myself, to procure good evidence of antimony in a liver containing not more than 1-160th of a grain in two ounces of its substance. We also employed the process successfully for the detection of free and absorbed antimony, when existing in very small quantity, in sixteen separate analyses of the viscera. Three of the bodies, from which the viscera were taken, had been buried for a period of from six to nine months.

ON THE COLOUR-TESTS FOR STRYCHNIA, AND THE DIAGNOSIS OF THE ALKALOIDS.

Being the substance of part of the Croonian Lectures for 1861, *delivered at the Royal College of Physicians.*

By William A. Guy, M.B. Cantab., Fellow of the College, and Professor of Forensic Medicine, King's College, London.

(*Continued from vol.* xxxiv, *p.* 732.)

In the first series of experiments I placed side by side two rows of porcelain slabs, twenty in each row; on each slab of the one row, a drop of the acid solution, and a fragment of the peroxide of manganese; and on each slab of the other row, an equal drop of the same solution, and an equal fragment of the peroxide of lead. I stirred the several fragments into the several drops of acid in the same way, and obtained highly characteristic results with the peroxide of lead in every instance; but with the peroxide of manganese there were three instances in which the first colour was imperfectly developed. In the other cases the first colour was very distinctly produced. But the action of the peroxide of lead was certainly more speedy and more delicate, as well as more constant, than that of the peroxide of manganese. The solitary advantage possessed by the peroxide of manganese consisted in the greater permanence of the third colour. But as this advantage is very small, as compared with the quickness, delicacy, and certainty of the action of the peroxide of lead, in developing the first and most characteristic of the strychnia-

tests, I had no hesitation in selecting the peroxide of lead as the better of the two insoluble tests.

The experiment with the three soluble tests was conducted in the same manner with three rows of twenty slabs each, and it issued in showing the superiority of the permanganate of potash over the bichromate of potash and the ferricyanide of potassium in the richness and clearness of the first and most characteristic tint. The subsequent colours were also clearly brought out. But the permanganate of potash resembled the bichromate of potash in exhibiting less permanency in the third tint than did the ferricyanide of potassium. It resulted from a careful comparison of these three tests that the permanganate of potash is to be preferred to the other two.

There remained, therefore, to be submitted to a further comparative experiment the peroxide of lead, as the better of the first group of two, and the permanganate of potash, as the best of the second group of three.

The comparative experiment for this purpose was the exact counterpart of those just described. Twenty experiments with the peroxide of lead were compared with twenty similar experiments with the permanganate of potash. The result was decidedly in favour of the permanganate of potash, which gave in every case a clear, rich blue colour, while the colour with the peroxide of lead was less clear and bright, being sometimes obscured by the colour of the portions not dissolved. In two of the experiments the result was not satisfactory.

I repeated these comparative experiments with several stains left by the evaporation of solutions of strychnia in benzole, and found the permanganate of potash to yield characteristic results where the peroxide of lead failed. I estimated the quantity of strychnia in these stains at less than the thousandth of a grain. The permanganate of potash acted characteristically in every instance.

Having thus ascertained the superiority of the permanganate of potash to the peroxide of lead, I made a final experiment with the three soluble colour-developing substances; the permanganate of potash, the ferricyanide of potassium, and the bichromate of potash. I took eighteen glass slides stained with deposits of strychnia, some from the solution of the alkaloid in benzole, and others from a solution of the acetate decomposed by the vapours of ammonia. I arranged the eighteen stains in groups of three, putting those of equal size together, and I noted the results at once by the position of the slides. All the spots were first treated with a single

drop of strong sulphuric acid. The acid solutions were then treated with equal small fragments of the colour-developing substances, six with the permanganate, six with the bichromate, and six with the ferricyanide. In one group of three all the reagents failed. This experiment was, therefore, excluded. But the remaining five groups gave the following results:

The ferricyanide of potassium gave faint indications of strychnia in two instances, and failed in three.

The bichromate of potash acted characteristically once, gave faint indications twice, and failed twice.

The permanganate of potash acted quite characteristically five times, producing a clear brilliant blue solution, changing to mulberry and to bright red.

In these last experiments I estimate the quantity of strychnia in the stains at about the $\frac{1}{1300}$th of a grain.

The answer to the second question—of the colour-tests for strychnia, which is to be preferred?—is, therefore, evidently in favour of the permanganate of potash. The remaining questions must be reserved for future consideration.

I now proceed to discuss the third of the four questions propounded in my first communication, namely, Are the colour-tests, or is the selected test, open to any serious objection?

Of chemical tests in general, it may be said that they are more or less liable to the following objections or disparagements:—1. They may be wanting in delicacy; that is to say, they may not be able to detect minute quantities of the substances to which they are applied as tests. 2. They may be wanting in certainty; in other words, they may fail from slight causes difficult to appreciate and define, such as the quantity or proportion in which they are applied, or the strength of their solutions if used in the form of liquid. 3. They may give rise to transient effects, or to appearances difficult to describe or define. 4. They may be unusually liable to failure from impurities in themselves, or in the matters to which they are applied as tests. And, lastly, they may produce of themselves appearances nearly allied to those which they occasion when added to the matters under examination.

From the first of these objections all the colour-tests for strychnia are certainly free. They are able to detect very minute quantities of the poison. From the fourth objection, too, as it will presently be shown, they are at least as free as the majority of chemical tests. To the second, third, and last objections they are certainly exposed, but under

what circumstances and in what degree it will be necessary to inquire.

The occasional failure of the colour-tests for strychnia from slight and obscure causes is not to be denied. It is proved by the experiments already detailed, and is admitted by all experienced chemists. But it should be understood that this objection has only a limited application. It goes only to the extent of impairing the value of the evidence derived from a negative result. If the colour-tests fail when applied to a spot acted on by sulphuric acid, their failure is not conclusive evidence of the absence of the poison. It affords a strong probability of such absence, but nothing more.

The reactions of the colour-tests for strychnia are certainly transient. They are not like the permanent white, crystalline, or coloured precipitates afforded by most chemical tests. But the objection on this ground is also of limited application. In experiments with the colour-tests made in the manner described in a former communication, we obtain two classes of results. We may get a mere trace or "flash" of blue, or we may obtain a deep, rich, blue colour, lasting for several seconds, for half a minute, or even for forty-five seconds, and succeeded by the other tints already described. Now those who maintain the value of the colour-tests for strychnia do not pretend that a mere flash of colour affords such evidence of the presence of strychnia as could be used with safety in a court of law; but they would probably be found to assert with equal confidence that a deep, rich, blue colour, developed by the colour-producing tests for strychnia, and continuing for several seconds in a spot previously treated with sulphuric acid without change of colour, and then succeeded by other colours, affords good evidence of the presence of strychnia. Though the blue colour soon passes away, there is ample time afforded for its complete recognition.

In answer to the objection that the sucession of colours is difficult to describe or define, it will suffice to state that though it may not be possible by any words that we can use to describe the successive colours developed by the colour-tests, it is not necessary to do so. For the first deep, rich, blue colour, characterised by the property of want of permanence, is in itself so remarkable as to constitute a most valuable and trustworthy test for strychnia.

The colour-tests for strychnia are certainly open to the objection that the colour-developing substances are themselves coloured. The peroxide of lead is puce coloured, the

peroxide of manganese black, the bichromate of potash orange coloured, the ferricyanide of potassium yellow or orange, and the permanganate of potash lilac. The peroxide of lead and the peroxide of manganese also colour sulphuric acid by admixture, and the bichromate of potash, ferricyanide of potassium, and permanganate of potash change the colour of the acid by solution. But it has been shown that the colours thus produced cannot possibly be confounded with the strychnia blue, and consequently form no valid ground of objection.

The fourth of the five objections applicable to chemical tests in general certainly does not apply with any force to the colour-tests for strychnia; for I can state, as the result of experiments with a great variety of substances, vegetable and animal, including all the matters that are likely to remain mixed with strychnia after its extraction from the contents of the stomach or from the fluids and tissues of the body, and further with many mineral substances, including common salt, arsenious acid, tartar emetic, and corrosive sublimate—all these animal, vegetable, and mineral substances having been added in quantities far exceeding those in which they could possibly exist as impurities in strychnia extracted from the contents of the stomach or from the fluids and tissues of the body—that the colour-tests are little, if at all, affected by such admixtures. This observation applies to the permanganate of potash equally with the bichromate of potash.

For practical purposes the reaction which demonstrates the presence of strychnia may be described as a clear, rich, blue colour, developed by the colour-tests in a spot previously treated by strong sulphuric acid without change of colour, the blue colour in question lasting long enough for perfect recognition, and then passing into other colours. In the absence of the blue colour we can affirm the probable absence of strychnia, but a mere flash of colour does not afford a degree of evidence upon which we ought to rely in a medico-legal inquiry.

(*To be continued.*)

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Annales de Médecine Vétérinaires, February, 1862.

MATTER TO SERVE FOR THE STUDY OF THE ANATOMY OF SPECIFIC OPHTHALMIA AND CATARACT IN THE HORSE.

By Dr. Sichel.

1st. The memoir of MM. Biervliet and Van Rooy, inserted in the *Annales d'Oculistique*, recalled to my memory numerous dissections made by me in the years from 1837 to 1841, I being then much engaged with the operation for cataract, consequent on specific ophthalmia, in the eye of the horse, and more especially with the anatomical alterations which are produced by this affection. Many horses were brought to me by veterinary surgeons for my inspection, and on them I operated with their concurrence whenever affected with cataract.

I found the operation to be always very difficult on account of the ocular muscles, which cause the eye to retract with sudden violence, anæsthetics not being then known. A great many eyes were also brought to me from the slaughterers, which were taken from horses that had been killed on account of blindness caused by specific ophthalmia. The number of eyes I have thus dissected amounts to more than sixty. The observations which I have collected constitute the type of all the principal alterations produced by specific ophthalmia. Other labours, principally the publication of my 'Iconographie Ophthalmologique,' prevented me from pursuing this interesting subject; but as two gentlemen most competent have taken the question up, although from a different side, if I am permitted to offer these "matters" in their imperfect state to the *Annales d'Oculistique*, perhaps the learned authors of the above-cited memoir may find some dates which, by being verified by further clinical and pathological researches, might be useful to them, and these sheets will at the same time contribute to the elucidation of the anatomy of cataract and the detachment of the retina.

The anatomical preparations, designated by numerous, in my collection, have been preserved in diluted alcohol. Those which might be of interest to the authors of the 'Memoir'

are at their service; but through the length of time and the impossibility in which I have often been placed of replenishing the alcohol, I cannot answer for their perfect preservation.

2nd. I must acknowledge that the result of my anatomical researches is not favorable to the hypothesis of the analogy existing between the pathology which constitutes *glaucoma* and that which takes place during and after an attack of specific ophthalmia. In the latter, irido-choroiditis certainly exists; but it follows a course and its termination is quite different from that of glaucoma, it being understood to apply only to those cases of specific ophthalmia which terminate in blindness; these being the only ones that can be compared with it.

3rd. That which more clearly distinguishes specific ophthalmia from glaucoma may be anatomically summed up thus—the cornea may become inflamed and ulcerated, but more frequently the membrane of the aqueous humour (*membrane de Descemet*), consequent on this phlegmasy, so rare in the human subject, but almost constant in specific ophthalmia in the horse. This membrane becomes opaque, either in striæ or in layers, and it is shrivelled. Plastic exudations are deposited between it and the iris. This last membrane forms adhesions with the cristalloid anterior, which also becomes opaque, striated, or in layers, resulting from the fibro-albuminous exudation on the posterior surface of the iris. The lens also becomes opaque. The cristalloid is often the seat of striated, chalky opacity, and may become corrugated. The lens, from several of my observations, may likewise become softened, liquified, and disappear altogether; and this occurs almost always under the influence of pressure from a liquid which is secreted between the choroid and the retina (*hydropisie sous choroïdienne sereuse et sanguinolente*—'Iconographie Ophthalmologique,' p. 498). This loosens the retina and forces it towards the centre, and when thus loosened it forms a sort of cone, the base of which is anterior and the apex posterior. The apex, under the incessant pressure of the fluid effused, is ultimately torn from the papillæ of the optic nerve, where there remains now only a simple vestige or a papilliform mamelon, or else a thin, cylindrical cord, either short or elongated. The anterior portion of the cone is more and more pushed forward after the rupture of its apex, and becomes by degrees more rounded and flattened, and afterwards forms itself into an adventitious body, surrounded with a false membrane, generally adhering to the crystalloid posterior, and containing the débris of the hyloid (*Obs.* 2 and others).

In case of the absorption of the lens, this false membrane

also contains the two layers of the cristalloid, and adheres to the posterior surface of the iris. As long as the lens still exists its anterior capsule is often attached to the iris by a pseudo-membranous exudation, which may increase to the formation of false membranes obliterating the pupil. The atrophy of the globe of the eye ('Iconographie,' p. 427) is an ordinary consequence of the violence of the ophthalmia. It more frequently takes place after the other anatomical alterations than after simple cataract, with which, however, it may coexist.

4th. Nothing of this takes place in glaucoma. The capsulary or pseudo-membranous cataract, the synechiæ posterior, the small pseudo-membranous bands or false membranes of the pupil, the detachment of the retina, the absorption of the vitreous humour and the lens, all these are absent in glaucoma, or if they exist are merely accidental. Atrophy likewise rarely supervenes in glaucoma, while it is one of the ordinary terminations of specific ophthalmia; principally, however, when its march is rapid and the attack acute.

5th. These conclusions, deduced from the observations annexed, and which have been selected from a large number, may appear somewhat arbitrary. Other observations and other dissections may perhaps partly invalidate them. It was, however, necessary to put them into shape, so as not to leave my work too much without data and apparent usefulness. I have added at the end of these sheets "On Cataract and its Operation in the Horse" a few words deduced from the same dissections. At all events, I must beg the reader to excuse all errors in this narrative which might have escaped me, owing to the very short space of time I have been obliged to collect, revise, and copy rough notes made off-hand during dissection, as well as hastily to add the reasons for their introduction, so as not to cause the publication of these documents to be again postponed after more than twenty years.

6th. Taking my stand on the anatomical grounds which I have tried to establish in the preceding pages, I cannot consider as founded on true theory the application of iridectomy to specific ophthalmia in the horse. In glaucoma this operation is destined to remove the intra-ocular pressure. There exists neither the exudative phlegmasy of the membrane of Descemet, nor acute iritis nor sub-retinal effusion. The contrary to this takes place in specific ophthalmia. An incision into the cornea, such as might be made with the lanceolar knife, and the excision of a considerable portion of the iris, might cause serious inflammatory accidents, and tend to more violent exudations

and suppuration. A simple puncture of the globe of the eye seems, therefore, more rationally indicated here, and it should be made in the cornea with a straight cataract-needle of tolerable size. This method, which was first introduced by Wardrop, where recourse was had to the puncture of the sclerotica, made with the lanceolar knife or with the paracentesis knife, in the direction of and parallel with the rectus muscle, as I have proposed, and which has been done by myself. (*Vide* 'Iconographie,' pp. 358, 649, 898, and *Clinique Européenne*, 1859, Nos. 1 and 2.) Whichever of these methods is made choice of, both appear to me to be free from danger and quite as effective as iridiotomy, but experience alone will decide.

7th. Finally, to show more forcibly the nature of the anatomical alterations, principally to those who have not had the opportunity of making pathological researches, I have headed the account with a description of a healthy eye dissected for the purpose, placing it at the commencement of my researches in order to serve as a point of comparison. This dissection terminates at the lens, on account of a curious fact which will be often alluded to in the course of these observations, and which I had proposed further to investigate had not my studies on this subject been interrupted. The anterior crystalloid in the horse has two leaves or layers, the exterior thinner, hyaline, and as if serous; but probably the epithelium, which is thicker in the horse, can be easily separated entire, whether in the healthy eye or in the one which has suffered from ophthalmia. This layer does not become thickened or opaque by the phlegmasia, which seems to have no effect on it. The posterior layer, which is thicker, becomes notably opaque and thickened after an attack of ophthalmia. I recommend to those who feel an interest in normal and pathological anatomy to pay particular attention to the second, fourth, sixth, and eighth observations, where this anatomical peculiarity is provisionally designated as the anterior (*cristalloïde double*), and to try to demonstrate it by repeated dissections of both healthy and diseased horses' eyes, and more particularly by employing the microscope. Perhaps it is not that of a hyaline membrane covering the anterior surface of the anterior crystalloid. I have not had time to search in works on comparative anatomy respecting it.

1*st Obs.—Dissection of the healthy eye.*

The choroid is intimately attached to the sclerotica, principally in the posterior hemisphere of the globe of the eye. The tissue of the choroid has a certain density and retinence. Its posterior surface is downy, and it is difficult to separate

it from the sclerotica without tearing its fibres, so closely are they united, more particularly at the point corresponding to the *tapetum*. The sclerotica presents at its convex surface a coat of pigment, which is, so to say, almost organized and transformed into a distinct, downy, villous, velvety, brownish tissue, which seems to be composed of a mass of fibres closely intermixed with one another. When the eye of the horse is put in alcohol a second leaf or layer is perceived, belonging to the choroid, and covering the anterior surface of this membrane. This leaf is more apparent on the surface of the tapetum. It is of a brownish colour, very thin, semi-diaphanous, and easily torn. In the eye of the horse I have distinctly seen the membrane of Jacob, which is extremely delicate, thin, and diaphanous, and is situated between the retina and the choroid. When the eye is much shaken in water this thin membrane detaches itself in the shape of small, triangular fragments, which float in the water.

2nd Obs.—Capsulo-lenticular cataract, anterior crystalloid double sub-retinal effusion, atrophy of the eyeball (No. 169).

It is the eye of a horse slightly atrophied, but not much diminished in size. This eye presents alterations which have often been found in eyes atrophied consequent on specific ophthalmia, viz., accumulation of a yellow-reddish fluid in the cavity, formed behind by the choroid, and anteriorly by a membrane formed by the remains of the retina, the hyaloid, and the posterior crystalloid. This membrane constitutes a pseudo-membranous tissue, extending behind the lens, which, however, it leaves free. It is thin, but firm, unequal in thickness, varying from half a millimètre to a millimètre, but terminating by a triangular thickening, the base of which measured at different points from four to eight millimètres, and it pushes against the corpus ciliari in every part. In this manner the false membrane forms a partition which divides the ocular cavity into two compartments, one anterior, and the other posterior; the former filling the space occupied in the normal state by the anterior and posterior chambers and by the crystalline apparatus. The posterior compartment occupies the space of the vitreous humour and the retina. The posterior wall of this compartment is formed by the doubled sclerotica and the choroid, both of them normal, except their having receded; and their unevenness is symptomatic of the slight atrophy of the globe of the eye. The sub-choroidean cavity is thus somewhat smaller than in the healthy eye, occupied by the retina and the vitreous humour, but larger than the same cavity in most of the sub-choroidean

hydrops, in which case the retina and the vitreous humour are more voluminous. At the place where the optic nerve expands itself into the retina, there exists only the remains of a filament, which comes out of the sclerotica and traverses the choroid. The summit of this filament, which was primarily attached to the retina, is torn off, as usual, in the last stage of the malady, in consequence of the increased quantity of the fluid secreted, which has at first pulled and elongated it, and thinned the nerve and the summit of the retinean cone, and afterwards torn it off, as may be seen in several other of the preparations. This filament is ten millimètres in length and three millimètres in thickness at the posterior part, and one and a half at the anterior. The crystalline lens and its capsule are lodged in a small cavity (the disorganized hyaloid cavity), inclosed in an incomplete sac formed by the anterior surface of the false membrane, which latter is formed posteriorly by an agglomeration of the retina and the hyaloid, penetrated and covered by the newly exudated plastic matter. Anteriorly, the false membrane adhered to the still normal iris. Here also we find this remarkable disposition, that the capsule of the lens may be extremely thickened and coriaceous. On incising it, a small quantity of turbid liquid was liberated, which surrounded the yellow but still somewhat consistent nucleus of the crystalline lens. But what was my surprise when I found that altered, but still covered in its whole extent by another thin and perfectly transparent membrane, which could easily be detached. It doubled on itself, and was as fragile as glass. This membrane formed the external layer of the anterior crystalloid.

3rd and 6th Obs.—Eyes of horses dissected in 1837.

Obs. 3 is the right eye of a horse (No. 155).—Ulcerated cornea, atrophy of the eyeball, bloody effusion under the retina, cataract, capsulo-lenticular. Behind the cornea can be seen a reddish tint, owing to blood effused in the anterior chamber. On opening the sclerotica, by making a circular incision in it, the choroid appeared healthy, but the retina seemed to have disappeared. There existed a cavity formed by the choroid, the anterior wall of which was formed by the retina and the remains of the hyaloid; it was contiguous to the posterior capsule of the lens. The anterior part of the vitreous humour had disappeared, and the cavity was filled with a blood-red liquid. Between the membrane of Descemet and the iris was found a layer of plastic blood, strongly adhering, a band of which extended to the ulcerated cornea. The pupil was completely obliterated. The capsule of the

lens was considerably thickened, and covered with cretaceous striæ. The crystalline lens was yellowish, and falling into detritus.

4th and 6th Obs. (*Nos.* 156-7-8).— Capsulo-lenticular cataract, sub-choroidean hydrops, atrophy, crystalloid anterior double.

The left eye of the same horse, with two others, presenting analogous alterations. In all three there is strangulation and roughness of the sclerotica, the same as is found in atrophied eyes. In two of these eyes the optic nerve, after having traversed the choroid, resembles, at the point of its insertion, a mamelon or papilla. In one case the optic nerve sends off a sort of prolongation in the shape of a very fine filament to the rest of the retina. In all three of these eyes existed a kind of hydrops between the choroid and the retina. The cavity containing the liquid is formed by the concave surface of the choroid. In one of these eyes this cavity contained some yellowish liquid, in the other it was brownish, and almost greenish. In each the quantity was from fifteen to thirty grammes. The retina and the remains of the hyaloid formed the anterior wall of this cavity. The ciliary process can be easily distinguished. This anterior wall forms at the same time the posterior one of a sac containing the lens and its capsule. This sac, of which the anterior parietes are formed by the iris, has its anterior surface covered by a pseudo-membrane. The opening of the pupil is completely obliterated. There is capsulo-lenticular cataract in all three cases. The capsule is much thickened and cartilaginous in all. In one there is an adherence to the iris. In another there are a number of white, chalky points. The crystalline lens is of a dark-yellow colour, but reduced in size in one of them, so as to leave a cavity between it and the capsule, which is filled with a reddish-coloured fluid. In one case the lens has entirely disappeared; the capsule is thickened and compressed on itself.

Arid siliceous cataract (*carious*).—In this case the capsule is still covered with a very thin membrane, which is transparent and brittle, like glass, in fact, analogous to that of Descemet, from which it is only separated by the iridian diaphragm. In one of these three cases there exists positively this same envelope of the capsule or double layer of the anterior crystalloid. In two cases there is an adhesion of the iris and the cornea, without any trace of ulceration. In one of these two cases the whitish exudations on the anterior surface of the iris have a starry aspect, and present eleva-

tions and depressions. At the same time may be observed on the posterior surface of the cornea (on the membrane of Descemet) elevated striæ, a species of folds, the situation of which corresponds with that form of striæ which are produced by the plastic matter effused on the surface of the iris. If by the microscope no perforations of the cornea are discovered, we must admit that specific ophthalmia completely dries up the aqueous humour, and twists and corrugates the cornea, and brings it thus in immediate contact with the iris, to which the exudations of its two contiguous surfaces finally unite them one to the other. Some of my preparations (*vide Obs.* 7, 8, 9) seem to bear out this view.

The chemical analysis of the liquor deposited in the choroidean cavity of the three eyes (Nos. 156-57-58) made by M. Pajot.—1st. The liquor of No. 156 was of a white-yellowish aspect, an oily consistence, strong and unpleasant odour, similar to that of decomposed animal matter. Its composition was principally water, with a small quantity of albumen, and those substances which are soluble in alcohol, viz., hydrochlorate of potass, acetate of soda, with some animal matter; substances soluble in water, viz., carbonate of soda, phosphate of soda, with some colouring matter; and finally, those which constitute the serum of the blood.

2nd. The liquor of No. 157 contained the same substances as the first, possessing, moreover, some fibrine and a colouring principle like that of the blood. It also held in suspension some coagulated blood, not decomposed, but united to a large quantity of albumen. The odour was the same as the previous fluid, which was owing to the commencement of putrefaction. Finally, some traces of the salts of iron or of manganese were found, which might indicate the presence of pigment.

3rd. The liquor of No. 158.—This was composed almost exclusively of water and albumen, of a dark-yellow colour, and seemed to contain a larger quantity of the salts of iron than No. 2. It was of a great density, and did not hold in suspension any of the constituents of the blood, but contained more pigment.

The liquor accumulated in the eyes of horses similarly affected with ulcerations, and which were dissected on the 17th of July, 1837. This liquor was of a yellowish colour, transparent, the specific gravity above that of water, and of a peculiar odour, effervescent when agitated in water, and turning vegetable blue to green. It appeared to be composed of albumen dissolved in a large quantity of water. By adding an alkali it assumed the appearance of the white of

eggs. Its viscidity was so great that on pouring it from one vessel into another it fell in one mass. It coagulated at the temperature of seventy centigrade, also by adding sulphuric and nitric acids to it, through their combining with the soda by which the albumen was held in solution. Thus this liquor gave by the reactives the same result as the white of eggs, and it may be considered as nearly of the same composition, *plus* a peculiar odour appertaining to animal matter. The quantity of the albumen in proportion to the water is as 6 to 4. These analyses show that the sub-choroidean effusion is formed by albumen and serum in different proportions, and in cases of reddish tinge also of the colouring principle of the blood. In the human eye I have often found crystallized cholesterine in the serous sub-retinous effusion, particularly when it was of a yellow colour.

7th Obs.—Eye of a horse, dissected July 27th, 1837 (No. 172). The membrane of the aqueous humour partially corrugated, opacity and adhesion to the iris, sub-retinous effusion and atrophy. This eye presented the usual alterations which are found in the atrophy of the eye of the horse, viz., accumulation of a coloured fluid in a cavity formed posteriorly by the choroid, and anteriorly by the retina and the hyaloid. These last membranes are in the same state as in the other cases already described. They form the posterior parietes of a sac in which are usually contained the capsule and the lens, but of the latter there was no trace left. After having cut the eye into equal hemispheres, one anterior and the other posterior, and having found the alterations indicated, we divided the cornea into four parts; it was then easy to separate the membrane of Descemet, which was thickened throughout its whole extent, presenting towards the middle a corrugated aspect. In this part it had lost its transparency and was of a whitish colour, while the remainder of this membrane was unchanged. The membrane presented, besides, some adherences with the iris, black bands extending from the one to the other. The iris was thickened, principally in those parts corresponding to the diseased parts of the membrane, and everywhere it adhered to the anterior parietes of the sac formed by the retina and the hyaloid. This membrane could easily be separated into the several layers of which it was composed, and which were of a certain thickness and a whitish colour.

8th Obs.—Synechia anterior, obliteration of the pupil, crystalloid anterior, double capsulo-lenticular cataract, sanguino-sub-retinous effusion, atrophy of the globe of the eye (No. 173 *bis*). An atrophied horse's eye, dissected the 2nd

of July, 1837. It was the seat of an accumulation of blood in a cavity formed on one side by the choroid and on the other by the retina and the hyaloid, which was pressed forward. Before dissecting this eye, which was considerably diminished in size, an opacity which nearly covered the whole of the cornea was perceived to exist, and no trace of the pupil could be seen. In dividing the thick, false membrane which contained the remains of the retina and the hyaloid, and which formed the anterior wall of the cavity, a portion of the posterior surface of the cataract, which adhered to the membrane was excised. Similar adhesions existed at the anterior surface, which united it to the iris. In this case also it was easy to separate from the whole surface of the cataract this transparent hyaline membrane which we have often indicated, and respecting the nature of which we are not informed, as it was also found in eyes which were not diseased. We consider it to be the anterior layer of the anterior crystalloid. Under this serous membrane was found the capsule, much thickened, and enclosing the yellow nucleus of the lens, which was surrounded by a turbid liquid. The iris was at every point adhering to the posterior surface of the cornea. The tissue of the latter was much thickened. In dissecting it the membrane of Descemet was easily separated, with the exception of one portion at the inferior part, which adhered to the iris. The pupil was obliterated by a thick, false membrane, of a whitish colour. It is remarkable that in this case all the parts of the eye had suffered from the attack of phlegmasia, with the exception of the anterior layer of the anterior crystalloid and nearly the whole of the membrane of the aqueous humour.

9th Obs. (No. 176 *bis*).—Atrophy of the globe, synechia anterior complete, ossification of the retina.

This preparation belongs to a series of observations relating to the atrophy of the globe of the eye and the ossification of the retina, consequent on specific ophthalmia, and is only cited here on account of the synechia anterior being complete. In another atrophied eye of the horse the same adhesions of the choroid and the sclerotica, also of the membrane of Descemet with the capsule of the lens and the iris, existed. The posterior half of the globe was converted into a solid mass of a dark colour, intermixed with whitish and grayish parts, in which none of the original tissues could be recognised. Here, likewise, bony particles were found mingled in this amorphous mass.

10th Obs.—The eye of a horse dissected on 8th of June, 1837 (No. 162 *bis*). Simple lenticular cataract.

The external appearance of the eye before dissection showed a lenticular cataract, with opacity of the eye, which was of a grayish, aqueous tint. On dissection, the crystalloid was found to be perfectly transparent, but there was opacity of the lens, with a commencement of a division of this body into three triangular fragments, the same as in man. On removing the choroid backwards, the vitreous body was perceived to be of a marked greenish colour, though it had not undergone any alteration in its transparency, which was perfect when the covering of the eye was removed. The greenish aspect was evidently the result of the blue tapetum of the choroid being seen. There was no other alteration in this eye. It was one of the rare cases of simple lenticular cataract. I am not aware that this horse was ever affected with specific ophthalmia.

11*th Obs.* (No. 163).—Bloody effusion in the anterior chamber; synechia, both anterior and posterior; capsulo-lenticular cataract; sero-sanguineous, sub-retinous effusion; atrophy of the globe

The exterior aspect before dissection was—the cornea transparent, through which was seen a yellow opacity, the seat of which seemed to be in the anterior capsule. This was mixed with striæ of blood, which affected nearly the whole vascularity, without, however, communicating with one another, so as to form ramifications of the vessels. Between these striæ were found deposited small layers of brown pigment. The iris seemed to adhere at several points to the crystalloid. The globe of the eye was completely atrophied, the surface of the sclerotica corrugated. On dissection, small ecchymosis spots were found between the sclerotica and the choroid. On dividing the latter membrane, a bright-yellow fluid escaped. This was accumulated in a cavity formed behind the concave surface of the choroid or the tapetum, and anteriorly by the retina pressed back towards the posterior capsule. After having emptied the cavity of this liquid, some coagulated blood was found on the tapetum, which was deposited in small layers. At the entrance of the optic nerve there was a tubercle of a grayish colour, composed of a nervous mass; of the optic nerve, there remained but one filament, which was attached to the posterior part of the retina. There were slight adhesions of the membrane of Descemet and the anterior capsule and the iris. The whole of the pupillary margin formed strong adhesions with the anterior crystalloid. This latter was opaque, without being thickened. Between it and the lens coagulated blood was deposited. The crystalline lens was opaque. In trying to

remove the iris from the capsule, some fragments of the pigment remained attached to the latter. The circumferences of the lens might be compared in their cortical layers to whitish, striated rays, while the surface was partly rough and uneven.

12*th Obs.*—The right eye of a horse (No. 164). Capsulo-lenticular cataract.

On dissection, the anterior and posterior capsules were found thickened; the anterior adhered to the iris, and it was, moreover, covered with small, white, cretaceous points. Deposits of the same substance were likewise found between the capsule and the lens. This latter was also covered with some plastic matter. The other membranes presented no alterations.

8. *A few words on the cataract in the eye of the horse.*

From the preceeding observations it may be concluded that cataract in the eye of the horse is almost always capsulo-lenticular and consequent upon specific ophthalmia, also accompanied by other consequences of this affection, such as synechia of the anterior and posterior parts, without mentioning those cases where grave alterations are found in the inner membranes, causing amaurosis and atrophy of the globe of the eye.

The operation for cataract is difficult on account of the adhesions and alterations of the crystalloid, &c.

The prognosis is always doubtful and unfavorable, on account of the disposition to phlegmasia which is left after an attack of specific ophthalmia, and the violent reaction that takes place, both externally and internally, after the operation.

I have never obtained perfect success in the horse from my operations for the cataract, neither have I ever operated on a case in that animal in which the cataract was not accompanied by some traces of the effects of the attack of ophthalmia, were it only a few exudative striæ on the capsule or some albuminous spots on the cornea.

In all my numerous dissections of the eyes of the horse I have only met with one simple lenticular cataract (*vide Obs.* 10) without capsular opacity or some pathological alterations of the other parts of the globe of the eye. Neither have I had the previous advantage of the use of anæsthetics, not having operated since 1840.

The retraction of the rectus muscle is also so sudden and violent in the horse that the operation by extraction is impossible, and that by the needle very difficult.

To support what I have advanced, there are other observa-

tions and dissections which might be published, if the readers of the *Annales d'Oculistique* should deem it necessary.

I have always considered morbid anatomy and pathology as the necessary complement to ophthalmology. I formerly devoted much time to it, and I cannot too strongly recommend it to the younger members of the profession, who have as yet much spare time on their hands.

There is still a vast field for investigation in ophthalmology, principally in Paris, where it is easy, without much loss of time or trouble, to procure eyes of horses affected with specific ophthalmia, and on which a complete study of all the alterations that take place may be made.

Veterinary Jurisprudence.

SHERIFFS' COURT, RED LION SQUARE, MARCH 20TH.

(*Before* Mr. Under-Sheriff BURCHELL *and a Jury.*)

SISSMORE V. STANFORD.

THIS was an action brought in one of the superior courts by Lieutenant-Colonel Sissmore to recover a sum paid on a warranty of two carriage-horses.

Mr. Laxton appeared as counsel for the plaintiff; there was no defence.

From the opening statement of the learned counsel and the evidence of Colonel Sissmore, it appeared that he was attracted to some stables at the West-end to look at two carriage-horses. As he was going, the defendant, a very gentlemanly man, with a military appearance, accosted him, saying, "You have been looking at two of my horses." The colonel said he had, and that they would not suit him, on which he rejoined that he had more horses, and took him to an adjoining stable. There the colonel saw two stately carriage-horses, which he purchased for £78 15*s.*, on a warranty to return the money in fourteen days. The colonel went to the Union Bank, in the neighbourhood, and drew a cheque for the money, which he crossed. The defendant said his banker was in the City, and wished cash, on which the colonel returned to the bank and paid him the money. The horses were sent to Datchett, where the colonel lived, and could not be used in his carriage. One was spavined and a whistler, and the other blind and a regular kicker. He could not find the defendant, and the horses were sold at Aldridge's for £25 19*s.* 6*d.* His loss, with the expenses, amounted to £60 4*s.*

The Under-Sheriff wondered that the anxiety to get the cash did not open the colonel's eyes.

The Colonel said the defendant appeared a gentleman.

The Jury found for the amount claimed, and wished the colonel might get the money.

WESTMINSTER.

BARBAROUS CRUELTY TO A HORSE.

Joseph Dorset, a labourer, in the employ of Mr. Morrieson, cow-keeper and wharfinger, of Queen's Road, Chelsea, was summoned at the instance of the Royal Society for the Prevention of Cruelty to Animals for inhuman treatment of a horse.

From the evidence it appeared that the prisoner was carting dung from a cow-yard in Pimlico with the horse in question, when one of the wheels sunk into the ground, and the cart was stuck so fast that the animal could not move it. He commenced at once beating and kicking it with his hobnailed boots. Ultimately he took the bit out of the horse's mouth, laid hold of his tongue with both hands, and for about three minutes attempted to pull the animal forward by it, causing the blood to flow freely, and form a large pool on the ground. The bystanders, shocked by such cruelty, threatened to punish the accused, upon which he desisted. The horse, valued at 48 guineas, is now unable to work, not having eaten its food for several days.

The prisoner, in answer to the charge, admitted that he did pull the horse's tongue, but alleged as a justification that the animal was always obstinate, and could work, but would not.

Mr. Paynter was of opinion that this was the most flagrant case of cruelty that had ever come before him or any other magistrate, and, having recapitulated the facts of the case, committed the prisoner for three months, with hard labour.

ARMY APPOINTMENTS.

War Office, Pall Mall, *March* 19, 1862.

John L. A. Poett, gent., to be Acting Veterinary Surgeon, March 18.

OBITUARY.

Died recently at Leeds, Mr. W. Wanfor, veterinary surgeon, formerly of Chesterton, near Cambridge. Mr. Wanfor obtained his diploma from the Royal Veterinary College, London, in 1816; for a short period he practised at Bedford, and afterwards removed to Ampthill.

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Communications and Cases.

PARTIAL BLOCKING UP OF THE TRACHEA OF A HORSE BY AN ORGANISED DEPOSIT.

[WITH SPECIMEN.]

By HENRY LEPPER, M.R.C.V.S., Aylesbury.

THINKING that the accompanying portion of a diseased trachea might be interesting in a pathological point of view, I take the liberty of sending it to you, as being in my opinion a very rare specimen of disease.

The history of the case is as follows:

On the 3rd of February I was requested to see a bay carriage horse, four years old, well-bred, and in good condition, the property of the venerable Archdeacon Bickersteth. The coachman complained that he made a great noise when driven, and more especially when going over rising ground. On testing him for roaring, I was much surprised at the difficulty of respiration which existed. The ordinary treatment of stimulating liniments to the throat was prosecuted for some time, but without any improvement. Trial was then given to the biniodide of mercury externally, and to daily doses of the hydriodate of potassium. During all this time the general health and spirits of the animal continued good, but the difficulty of respiration gradually got worse. On the 26th of February I adopted the recommendation of my much valued friend Mr. Robinson, and pretty freely applied the actual cautery to the skin, in the vicinity of the larynx, but without any relief being afforded.

On visiting him a month afterwards, viz., on the 26th of March, I found him much worse, and that the noise could now be heard at some little distance, even when he was in a state of quietude. A few days later, I satisfied myself that

the obstruction was not in or about the larynx, but lower down the trachea. Indeed, the noise could be distinctly heard throughout the entire length of the trachea, and about half way down the neck the tube was more prominent than is natural. The application of pressure to this part gave pain, and greatly increased the difficulty of respiration. Not being able to satisfy myself as to the precise nature of the obstruction, I felt disposed to cut down upon it, thinking that the respiration might be relieved thereby, or that, at any rate, I might be able to form a better opinion of the nature of the obstruction. I did not, however, do this; and on the 1st of the present month, April, I was hastily summoned to see my patient, the messenger stating that unless something could be done immediately to relieve the breathing, the horse would soon be dead.

On my arrival, I found this statement to be true. The poor animal was labouring for breath in a most distressing manner. He was bedewed with perspiration, and staggering to and fro in his box. The tongue was livid; the membranes congested, and his whole appearance indicative of death from asphyxia. With great difficulty, and not unaccompanied with danger, I cut down on the trachea, hoping to afford relief by making an opening into it very low down the neck, but much to my surprise and disappointment I found it blocked up by a firm deposit, which would not give way to the pressure of my finger. The poor animal soon fell to rise no more.

I am sorry that circumstances prevented my sending the specimen at an earlier date, but the delay arose from my desire to afford my excellent friend, Mr. Ceely, surgeon of this place, an opportunity of examining it, particularly as he saw the horse a few days before his death. The adventitious deposit which you will observe to have encroached upon the calibre of the trachea would appear to have been a considerable time in forming, as its texture is very solid and firm.

[The specimen sent by Mr. Lepper consisted of a portion of the trachea, eighteen inches long, the calibre of which was diminished to about one fourth of its usual dimensions by an organized fibrinous deposit. This adventitious material occupied the space between the *transversalis muscle* and the cartilaginous rings, at the posterior part of the tube. At its thickest part it was fully an inch and a quarter in substance, and from this it gradually became thinner towards the upper portion, which reached as high up as the sixth ring of the trachea. How far the deposit extended in the direction of

the lungs, we had no means of determining, nor does Mr. Lepper's communication make any mention of this. The mucous membrane of the trachea was thickened, but free from any increased vascularity. It overlaid the deposit in a rugose manner; the rugæ being more marked in some places than in others. They ran parallel with the long axis of the trachea.

We have seen several analogous cases in the ox, which are usually complicated with lymph deposits in the lungs, but until now we have never witnessed an instance of the kind in the horse. No treatment can possibly avail in these cases.]

BOTANY AS APPLIED TO VETERINARY SCIENCE.

THE BOTANY OF FUNGI.

By W. Watson, M.R.C.V.S., Rugby.

(*Continued from p.* 150.)

In the February number of the *Veterinarian* will be found a very interesting account of the death of several horses, produced by the animals having partaken of oats infected by a parasitic vegetable fungus of the "*Aspergillus*" species. These cases occurred in the practice of Mr. Mitchell of Leeds, and were communicated to Professor Varnell, and by him published with experiments and investigations by himself and Professor Tuson. The facts recorded by these gentlemen are of much importance, and well worthy our consideration. With a view, therefore, of drawing further attention to the subject, I purpose for the present deviating from my observations on plants which yield food for animals, and avail myself of the advantages which this opportunity affords of bringing under notice some of the botanical characters of the tribe of plants to which these vegetable parasites belong.

At the commencement of my remarks upon the systems under which plants are classed, it will be remembered that according to the "natural system" the vegetable kingdom is divided into three great primary divisions. Two of these have already been described, viz., *Exogens* or *Dicotyledons* and *Endogens* or *Monocotyledons*. In each of these divisions the plants have stems, leaves, and flowers, and yield true seed. We shall now proceed to give a brief description of the third division, to which the name of *Acrogens* or *Acotyledons* is given.

This division of the vegetable kingdom differs from those previously described, in containing plants the substance of

which in nearly every variety is made up of cellular tissue (the exception being in the ferns), in having no true flowers with stamens and pistil, and in producing no true seed, consequently they are without embryos,—reproduction being brought about by minute granular matter called *spores* or *sporules*. A few of them, as the ferns, have stems and leaves in which the woody matter is arranged in a zigzag manner, but the great mass of these plants rank low in the scale of vegetable growths. They comprise from 8000 to 10,000 species, or nearly one fifth of all the plants that exist. Amongst the most common plants which go to make up this division of the vegetable kingdom may be named the ferns, mosses, lichens, moulds, fungi, and algæ or sea-weeds. "They are scattered over all climates and all quarters of the world, replenishing both earth and sea with vegetable life, and ascending into the region of the air, by the very levity of their seeds, spores or bulbules, to be wafted on the winds, till drenched with moisture they descend again towards the earth, ready to cling to the soil that suits them, if it should be even the surface of the flinty rock, or to spread themselves over mountains of eternal snow, or to immerse themselves in the waters of the ocean."

Most of them are very minute and of much interest, but require great time and patience with a good microscope to be thoroughly understood. The species of Aspergillus described as producing the death of the animals in question belongs to the above class of plants and to the natural order *Fungi* (Fungals). A familiar illustration will be found in the *Agaricus campestris* (mushroom) to the different parts of which the following name is given. When the stem arises from a bulbous enlargement near the ground, this is called the *volva*, and the expanded cap on the top of the stem the *pileus*, beneath which will be found a number of lamina or plates which are called *gills*.

The fungi are an exceedingly numerous class, some of them obtaining considerable size, but they are for the most part very minute. Some are much valued as food, such as the *Agaricus campestris* (mushroom), *Tuber cibarium* (truffle) and the *Morchella esculenta* (Morell) while others have proved themselves most dangerous poisons, such as the *Agaricus muscaria* (the fly agaric), &c.

The Fungi contain a principle called *Fungin*, containing a large amount of nitrogen, and very nutritious, much resembling fibrin; but in many this is combined with poisonous narcotic and acrid properties, which in some instances have produced very injurious and fatal effects. The cases recorded with the experiments and observations carried out by Professors Varnell and Tuson are of great interest to the profession,

opening as they do a somewhat new and wide field for future investigation. When we reflect that eight animals have been destroyed by this fungoid parasite, and also on the small quantity of it and the short space of time sufficient to bring about these fatal results, and come to consider that at certain seasons of the year the atmosphere is loaded with these vegetable germs, ready to grow wherever they meet with circumstances favorable to their development, we shall not be surprised if this unseen enemy be more frequently producing its injurious and fatal effects than we have hitherto had reason to suppose. Nor is one class of plants or animals alone affected, as nearly all our plants in certain seasons are more or less attacked by these vegetable parasitic growths. I shall have again to refer to this very interesting subject, when considering the poisonous plants; in the mean time I hope it will not be lost sight of by the profession, but receive that attention which its importance deserves.

(*To be continued.*)

THE EVIL OF EMPIRICISM AS CONNECTED WITH THE VETERINARY PROFESSION.

By George Bodington, M.R.C.V.S., Canton, Cardiff.

In the number of the *Veterinarian* for the 1st of April is a letter headed as above, by Mr. Elam, the truths of which must be patent to every one. It is, indeed, high time that some steps were taken, particularly by the members of the profession, whose labours are devoted to country practice, to awaken in the minds of our representatives in London, our President and Council, together with the lately formed Committee—the necessity, nay, the imperative *duty* of seriously and unflinchingly adopting every measure which shall protect us from the state of things which Mr. Elam has so vividly portrayed. There are many, very many, who can fully corroborate all he has said on this important subject. That the committee will do all they can I have no doubt, but the matter must not rest with them alone. The whole professional body is deeply concerned in the question, and I would urge upon every individual M.R.C.V.S. to be "*up and doing.*" We must not be afraid to agitate the question, until we find we are not only listened to, but our grievances are relieved, for depend upon it, as Mr. Elam

observes, this is "the question of questions to the veterinary surgeon." It is also one that must be dealt with in a spirit of energy, ability, determination, and *decision*. I am persuaded more and more every day, that until this matter is set at rest, by wise and prompt legislation, our much talked of charter, as well as our professional standing, must necessarily remain a dead letter.

Like Mr. Elam, I am surrounded by "*Quacks*" out of number—men who most unblushingly entitle themselves veterinary surgeons. These same men are allowed to take fees, which ought alone to be claimed by, and paid to a M.R.C.V.S. They are daily examining horses as to soundness, and have the effrontery to demand their half guinea fee, and write a certificate of their opinion; and if required, they are ready to give evidence in courts of law with all the nonchalance imaginable. I could enumerate, within a distance of five miles, not less than a score of such pretenders.

Enclosed I beg to send you a specimen of the way in which these persons palm themselves upon the public as veterinary surgeons.

"QUEENS' HOTEL
LIVERY & BAIT STABLES, ST. MARY-STREET,
CARDIFF.
DAVID LANSLEY

BEGS to return his sincere thanks for the support he has received for the past twelvemonths, and begs most respectfully to inform the Gentry, Agriculturists, and others, that in conjunction with his Son, he has added a VETERINARY ESTABLISHMENT AND SHOEING FORGE to the above Premises.

D. L. having for many years carried on such an Establishment in Bath, and his Son, having been principal Assistant to Mr. Peter Taylor, Veterinary Surgeon, Manchester, hopes, with his long practical knowledge of the above business, and his Son's assistance, to give satisfaction to all those who may favour them with their kind patronage.

The above Establishments are most centrally situated at the back of the Hotel, where every attention will be paid to Horses standing at Livery and put to Bait, &c. Also, good Lock-up Coach-houses, and every accommodation for Sick and Lame Horses entrusted to their care.

CONTRACTS TAKEN FOR VETERINARY MEDICINE AND SHOEING.

HORSE & CATTLE MEDICINE of every description supplied in Town or Country.

THE OMNIBUS To & From the DOCKS as usual.

N.B.—HORSES BROKE and TRAINED for all purposes.

A card of Terms sent on application."

Surely this ought not to be. To allow its continuance will be a disgrace to us all.

Our success, however, in this, as in all other things depends, not only upon the means we use and the efforts we make, but equally on the way in which we set about getting rid of the evil. To be effectual, the thing must be well done; and in order to be this, it must be decisive. I repeat, agitate, agitate continuously. Let our voices be heard in "Red Lion Square," and let us not cease till we are firmly and fairly placed upon an equal standing (as regards our rights and privileges) with our sister profession. This is a position which "in justice to ourselves and the public we are entitled to."

How can it be expected that men of education, respectability, and talent, will embark in a profession, if after expending a large amount of time and money to procure a diploma, they find that they merely admitted, as it were, into competition with ignorance and empiricism? If after all the fuss that has been made about our charter and body corporate, we are still to remain shorn of the very vestments with which the said charter was supposed and indeed ought to have clothed us—if we are to remain any longer in our present nakedness, the sooner we abandon the charter and rerobe ourselves the better. Then we may be enabled to steer our ship by a truer compass. Or if not, we shall as surely founder.

In order to effect this desideratum, let us make known our requirements, and in a body strive to secure them. When we have gained them, and not until then, we may rest assured there will not be wanting those who will be ready to become "of us," whose talents and position will fit them to be considered both as ornaments to the profession and an honour to the conntry.

ARECA NUT AS A VERMIFUGE FOR THE DOG.

By J. Hanly, M.R.C.V.S., Hyde Park Barracks.

As I have often heard the efficacy of the areca nut as a vermifuge underrated, I beg to send you a short account of the powerful effect it had on a greyhound bitch, the property of my father, Mr. Hugh Hanly, 1st Life Guards.

The case was rather remarkable on account of the bitch not showing the usual symptoms of worms, namely, want of condition, staring of coat, &c. On the contrary, she was fat, and her coat sleek, but, occasionally, on her coming from the

kennel, she would stagger about for a few moments, and her sight was impaired, as evinced by her inability to see a hare in coursing: she had voided a worm now and then.

I administered the areca nut, in powder, in a two-drachm dose in milk, having previously prepared her, by keeping her without food for twenty-four hours. In a quarter of an hour there was expelled a mass of tape-worms, which, upon careful examination, I ascertained to consist of the great number of forty-three. They varied in length from an inch to three feet, and each had a perfect head.

I have been induced to send this account for insertion in your journal, because I have rarely heard of the head of the parasite having been discovered, either in the human subject or the dog, although careful search has been made for it.

I saw, a little while since, a tape-worm that had been voided by a greyhound of the extraordinary length of thirteen yards and two feet, which had been also expelled by the areca nut.

I think these two instances prove the power of this agent in the dog. I have not heard any satisfactory account of its action on the horse, but should think that it well deserves a trial in that animal.

POISONING OF CATTLE AND A PONY BY ARSENIC.

By John Harrison, V.S., Brough.

As cases of poisoning by arsenic are not unfrequently recorded in the pages of the *Veterinarian*, I hope I shall not be accused of egotism in sending you the particulars of a case, with the analysis, &c., which has recently come under my observation.

During the last winter and spring, at intervals of a few weeks, Mr. Robert Thornborrow, farmer, of Mallerstang, a place about ten miles distant from Brough, lost three valuable cows, one stirk, and a pony, under circumstances of a mysterious nature.

As I did not attend any of the cases, I give the history of the malady with which they were supposed to be affected, on Mr. Thornborrow's authority, and which I have every reason to believe is correct. All the animals appeared to be well at bed-time; they had eaten up their last meal, and no previous diminution of the lactatory process had been

observed in the cows; in fact, nothing unusual had been noticed in any of the animals. On the succeeding morning, on entering the byre, some of the cattle were dead; but during the interval between bed-time and the period of death, they had evidently experienced an acute attack of diarrhœa, or, to use Mr. Thornborrow's own words, the dung was running out of the byre door as thin as water, and emitting a very disagreeable smell. The progress of the malady did not, in every case, run its course in so short a period, as some of the animals lingered on through the course of the next day, and part of the succeeding night. The symptoms in these cases were colicky pains, violent tenesmus, and the ejection with considerable force of fluid fæces emitting a disagreeable smell, which continued till they sank. The aid of a cow-leech was sought for some of these more lingering cases, who exhibited medicine to them, the action of which caused no remission of the symptoms. The pony lingered on for two or three days, but the same symptoms were observed as in the cattle. The carcases were opened by cutting through the abdominal walls in the direction of the linea alba. The intestines on being exposed showed symptoms of acute inflammation, or as the owner said, they were of a dark red colour in patches. He could state nothing further in regard to the post-mortem appearances. All the animals were buried almost immediately after death, as it was thought in the neighbourhood that it was some new and infectious disease which had broken out amongst them.

The immediate subject of my present communication is the last animal that died, namely, a valuable cow, two or three weeks before calving. Her death took place on the 18th of June last year. She appeared all right on the preceding night, and only lived a few minutes after Mr. Thornborrow entered the byre on the following morning, consequently she had no medicine exhibited to her. From the period of her death various conjectures and opinions as to the cause of the mortality had been expressed by Mr. Thornborrow's neighbours, who were all farmers and stock-keepers, and who agreed that no disease like it had been seen in the neighbourhood, or on that farm previously. Falling into company with Mr. Thornborrow on the 9th of May he mentioned to me these cases of "bad luck," as he termed them, with the symptoms as before detailed, and asked my opinion as to the probable cause of death, when I told him the symptoms and progress of the attack more resembled cases of poisoning than any known disease peculiar to cattle in this neighbourhood. Two or three days after this conversation took place, I was interrogated by Mr. Thorn-

borrow's brother as to the probability of finding the poison if the carcases were exhumed. To which I replied, that if it was a mineral poison (which I suspected it was) there would still be a chance of finding it on an analysis of the viscera. But I rather dissuaded him than otherwise as to the taking of such a step—so long a period having elapsed since the last death—that even if the poison were found, and he should suspect foul play, it would be difficult to criminate any party. However, on the 16th of May I received a message to the effect that I was to go the next day to Mr. Thornborrow's to witness the exhuming of the last cow that died, and to bring away a portion of the viscera for the purpose of analysis which I might require.

I may here state that on removing the soil from off the carcase, the vacuum caused by the partial decomposition of the body had become filled with water, the animal having been buried in a damp piece of ground. The flesh was nearly macerated off the ribs. On removing the latter, the liver, part of the small intestines, with the mesentery, and one of the kidneys floated on the surface of the water in a fair state of preservation. The stench being unbearable, we made no further search for any other parts. I cut off a portion of the liver, the small intestines, and the kidney, and placed them in a glass vessel, tied close down, and brought them home with me. Thinking that two corroborative opinions might satisfy my employers better than one uncorroborated, I obtained the assistance of a friend, Mr. T. Walton, experimental chemist, residing near Brough, and together we made the analysis, of which the following is a report.

Premising that the parts contained some mineral poison, soluble in boiling water, we placed a portion of the liver in a tumbler with some clear rain water sufficient to cover it. After subjecting this to boiling heat, on a sand bath, for about half an hour, the suspected fluid was twice filtered through bibulous paper, and then portions of it were subjected to the following reagents:

1. *Ammonio-sulphate of copper*, which gave a grass-green precipitate,—Scheele's green.

2. *Ammonio-nitrate of silver*, a flocculent yellow precipitate, soluble in excess of ammonia.

3. *Chloride of calcium*, a white precipitate.

4. *Caustic potash*, with excess of ammonia, being added to a portion, it was treated with a solution of sulphate of copper. On the application of heat, the red suboxide of copper was deposited at the bottom of the tube, indicative of the presence

of arsenious acid, but valuable only so far as corroborating the previous tests.

Having by these preliminary experimental tests obtained sufficient evidence of the presence of arsenic, we subjected another portion of the viscera to the following method for special confirming purposes. This portion was boiled with hydrochloric acid for a considerable time, filtered, and then some pieces of clean copper wire, hammered flat, were placed in the filtered fluid. The mixture was then boiled in a sand-bath on the fire for about forty minutes, and the copper, which was now coated with a dark steel-gray crust, was removed, carefully dried, and placed in a clean dry test-tube. After using precautionary measures to prevent the tube from breaking, it was subjected to considerable heat over a spirit lamp, which had the effect of causing a thick white sublimate to collect on the cool part of the tube. The copper being now removed, a little water acidulated with a drop or two of hydrochloric acid was poured into the tube, which with the aid of gentle heat dissolved the sublimate. This was now treated with ammonio-sulphate of copper, when we had the green precipitate as before stated with the neutral solution. These, along with other experimental tests, with different portions of the viscera, and with different reagents, together with the details of the symptoms, confirmed our opinion that the cow had been poisoned by arsenic, and our certificate was to that effect. I understand the matter was immediately after this placed in the hands of the police, who are making further investigations respecting it.

ON THE TREATMENT OF PARALYSIS IN THE HORSE WITH STRYCHNIA. OBSERVATIONS ON INDIAN HEMP.

By "Argus," India.

I have just read Mr. Hoey's letter on the use of Indian hemp in tetanus and paralysis. I have not used this medicine myself, nor have I seen it employed in veterinary practice, but in the treatment of paralysis I doubt if it will be found so efficacious as strychnia, viz., if the latter be employed judiciously.

I will give you two or three cases of partial paralysis successfully treated with strychnia, which will suffice to show that this agent deserves our confidence.

In 1858 I had under treatment a valuable Arab charger affected with hemiplegia. The symptoms were drooping of the off ear; partial loss of the use of the off fore and off hind legs, the feet being dragged along the ground when walking; atrophy of the muscles of the off side; and drawing of the tail to the near side. The animal could not walk in a straight line, and if he attempted to trot was certain to fall down. The appetite and general health were good. The patient had been in this state for about two months before I saw him. There was no assignable cause for the disease, except fatigue and exposure on the campaign.

I administered strychnia, beginning with half-grain doses twice a day, and gradually increasing the quantity until it reached three grains. After persevering in this treatment for about two months, during which I had sometimes to stop the medicine for a day or two, a perfect cure was effected, and the horse went to work again.

Last year I had two troopers affected with paraplegia, the animals being partially paralysed from the loins backwards. They could not turn except in a large circle, and then only at the risk of falling. They had no control over the action of the hind legs, and could merely attempt to advance them. Both were treated with strychnia, and were at their duty again in about two months.

Another case was so severe that the horse was down and unable to rise. He had strychnia administered, and recovered so far as to be able to rise and stand upon his legs, and, after some further time, to walk and trot. The horse, however, was not sufficiently restored to be able to carry a man and keep up with the other horses at a gallop. In all the above cases, except the first, mustard plasters were applied to the loins, followed by fresh sheepskins.

In advocating the use of strychnia, I am aware that I am not introducing anything new. I am, however, so convinced of its efficacy in cases of paralysis, that I think it but right to add the result of my experience to that of others, to prove that this valuable agent deserves a full and fair trial.

I intend to try Indian hemp with the first case of tetanus that comes under my treatment, but I confess that I do not anticipate much, if any, success. Traumatic tetanus seldom yields to any mode of treatment, either in the human subject or the horse. Of this we have had a sad illustration here lately; an officer received an injury in one of his hands, tetanus set in, and resulted in death forty-eight hours after its first appearance.

As the immediate effect of taking *bhang* or Indian hemp is

general nervous excitement, more or less intense, according to the quantity taken, I should say that theoretically its use is not advisable in a disease like tetanus. Again, paralysis and tetanus are diseases of the most distinctly opposite nature, and if *bhang* be an effectual remedy in one, how can it possibly be in the other?

Natives of India, even of the most cowardly classes, will, while under the influence of this drug, perform prodigies of valour, utterly regardless of personal risk, and are actuated by a desire to destroy all who come in their way, and this under circumstances where, if they were not drugged, they would bolt to a certainty.

SPAYING OF COWS.

Letter from Mr. Joseph Young, of Burntisland.

Gentlemen,—In the February number of your journal I read with no little surprise an article, entitled—"*Additional Observations on Cow-spaying*," by Andrew Calley.

As a party especially interested, having been the owner of the nine cows operated upon, and referred to in Mr. Calley's "Observations," I have, in vindication of truth, and also in justice to Professor Gamgee, no hesitation in giving an unqualified denial to the greater part of Mr. Calley's assertions.

Mr. Calley was surely, when composing the article, reclining upon "the baseless fabric of a vision," or he had his mind absorbed in the grave and remote incident which he mentions of "Pharaoh's dream," where the "seven lean-fleshed kine," in the Egyptian famine, had consumed seven of their graminivorous neighbours.

The article throughout seems to have been instigated more by a spirit of ill-feeling against Mr. Gamgee than, as its title purports, of conveying information to your readers by "additional observations" on the subject.

The facts are as follow:—When Mr. Gamgee came to me, requesting that I would allow him to test the utility of "cow-spaying," he called my attention to the opinion of M. Charlier, a well-known French veterinary surgeon. The object in view was that of asertaining whether the experiment would prove *commercially* advantageous or the reverse. I was present at all the nine operations, and can testify that the animals did not evince any great evidence of torture or agony. In

fact, they stood in their stalls fastened in the usual way, and did not require any additional appliance by chain or tether during the spaying process. Swelling ensued, and continued for two or three days. This, however, was anticipated; and after subsiding, the cows, with a little simple treatment, appeared to suffer no inconvenience from the effects of the operation.

One of the number was seized with *pleuro-pneumonia*, and I had her slaughtered; and on examining the region from which the ovaries had been removed, I was satisfied that the spaying process, *so far as the operation* was concerned, had been quite successful. The other animals were sold at intervals, and *the sacrifice* of value I now hear of for the first time from Mr. Calley, a remark which will also apply to the beef being either diseased or unsaleable.

Professor Gamgee did not charge *a fee*. In fact, before he commenced the operation suggested by M. Charlier, he distinctly stated that they were experiments for the purpose of testing its utility, and that he would neither ask nor accept a fee.

In the face of these facts, it is somewhat inconceivable how Mr. Calley could make the assertions he has done. So far also from any restriction having been put upon Mr. Gamgee's operations, I may here take the opportunity of stating that my whole stock was, with the most unlimited confidence, placed at his diposal for testing the operation in question.

From the days of Hippocrates up to the present time, science has always had its screech owls.

Independent of the request, however, to give the new operation a fair trial, so far as I am aware, Mr. Gamgee professed nothing of advantage. It will require a much longer time, and experiments on a greater scale, to decide the question correctly; and certainly this is not likely to be facilitated by any ill-timed or caustic remarks on the proceedings of the investigators.

I am,

Yours, &c.

To the Editors of the 'Veterinarian.'

Facts and Observations.

BRANDZIEKTE—SCAB—IN THE SHEEP OF THE CAPE.

In the *Cape Argus* we find the following letter, which probably treats of the so-called "new disease of sheep," a paragraph relating to which appeared in our February number.

"The brandziekte amongst sheep is, in this colony, a serious evil, in some seasons; and few farmers have taken much pains to prevent it or to cure it. Unfortunately many have made it a pretence for shearing twice a year, a most abominable and short-sighted practice, quite unnecessary, and very injurious to the sheep themselves. I myself have had very large flocks of woolled sheep for many years on various farms in this district and Colesberg. Few men, if any, in this colony have possessed more; but I never found it necessary, or at all desirable, to shear more than once a year.

"But now for a cure for the brandziekte, or scab, in its mild form. Most men in these parts of the colony know or have heard of Mr. Donald Sinclair, living on the farm 'St. Clair,' in the Winterveld, and that he has very large flocks of fine-woolled sheep, grazed upon that and surrounding lands belonging to him, and acquired by his own industry and untiring perseverance. Not five or six *hundred* sheep, averaging six pounds of wool each, as stated by one of your Cape papers, but five or six *thousand* of that kind, and a few thousands besides of inferior quality, and amongst them some Cape sheep; very useful for their tails when butter is scarce.

"My friend Mr. Sinclair, from whom I have the facts, took it into his head to wash his sheep when affected with brandziekte, and I believe sometimes even before, to prevent it, with a strong lye, made from the soap ashes which are procured by burning the ghauna bush, found in many parts of the colony, and more especially in the Karoo districts. I have seen it in all the Karoo plains of Graaff-Reinet. It formerly existed, and perhaps may still be found on the Great Fish River, and some parts of the Koonap. It is found in the Cradock district, and grows most luxuriantly in the district of Beaufort West, especially along the Ghamka River, which runs past the town, and flows, *when it runs*, westward towards Cape Town for some distance. Ghauna ashes, to make Boer soap, are sometimes sold on the Graaff-Reinet market, and it may always be procured somewhere

at a moderate price. Mr. Sinclair mixes with the lye a portion of aloes which abound in many parts of our colony. With a large soup-pot kept boiling with lye, and a couple of large tubs, Mr. Sinclair, with a few servants, will wash five or six hundred sheep per day, and he assures me he has found this remedy very successful. At all events it is a very cheap one, attended with no danger, and well worth trying.

"I thought of using this lye many years ago. The idea came into my mind through having had given to me a mangy young dog, which I put into a soup-pot full of lye, and allowed it to swim about for some minutes. In a week or two that dog was perfectly clean, and the young hair grew fast. I mentioned this circumstance to Mr. Collett, senior, of the Cradock district, and we were both of opinion that lye, made from the ghauna bush, would be a good remedy for the scab or brandziekte in sheep. Had I remained much longer on either of my farms I certainly should have tried it.

"Yours, &c.,
"W. SOUTHEY.

"GRAAFF-REINET; 19*th September*, 1861."

REGENERATION OF BONE.

THE Academy of Sciences has received an interesting communication from Dr. Demeaux, on the regeneration of certain bones of the face by the mucous periostic membrane. Our readers know that the larger bones have been successfully renewed by preserving the periosteum, as has been done by Drs. Sédillot, Maissonneuve, and others, but instances were wanting of a similar regeneration of the facial bones. Dr. Demeaux relates the following case:—A young man, æt. 22, was in 1855 afflicted with a naso-pharyngeal polypus of extraordinary size, which had seriously injured the face, and destroyed a portion of the palate bone on one side, so that the tumour protruded into the cavity of the mouth, being only separated from it by the mucous membrane, which had even been considerably thinned. The tumour was extirpated, and it was then ascertained that a surface of fifteen square millimetres at least was wanting in the bone. Six years later Dr. Demeaux met his patient again, and found that the bone had been completely regenerated. The second case stated by Dr. Demeaux is still

more curious. In October, 1859, a young soldier of the army of Italy returned to France after a long stay in the military hospitals. He had been hit at Solferino by a musket-ball, which had fractured the upper maxillary bone on the left side. On the following day the surgeon had extracted the projectile, a great many splinters of bone of various sizes, with three molars, and the portion of maxillary bones in which they were inserted. When this young man was examined by Dr. Demeaux, about one half of the roof of the palate was deprived of its bone, and the mucous periosteal membrane was the only separation existing between the nose and the fauces, a circumstance which materially impeded the patient's speech and power of deglutition. In the summer of 1860, when Dr. Demeaux saw him again, the palate, as well as the other missing bone, were found to have been completely regenerated.—*Galignani.*

THE PRESENCE OR ABSENCE OF THE GALL BLADDER.

At a meeting of the Zoological Society held on the 26th ult., Dr. Crisp read a paper "On the Form, Capacity, Situation, Presence or Absence, of the Gall-bladder, and the Colour of the Bile in the Vertebrata." Sketches of the gall-bladders of 306 species of the vertebrata, and the bile of 500 species of animals, were exhibited. The author mentioned that in some animals that were said "not to have a gall-bladder," this viscus was present; and that the supposed law that a gall-bladder existed in the hollow-horned ruminants and not in those with solid horns, was not to be depended upon, as was shown by numerous illustrations from the author's dissections.

PROCEDURE AFTER THE BITE OF A MAD DOG.

As of late years deaths from hydrophobia have notably increased in France, the Prefêt of the Seine, believing this to be due in part to a general ignorance as to the best mode of procedure after bites from a mad dog, has given full publicity to the recommendations made by the Council of Public Hygiene. According to these, the sole measure to be relied upon is the thorough and prompt application of a red-hot iron to the bitten part, the pain from such application being

less in proportion as the iron is heated nearer to a white heat. Any portion of iron of suitable shape should be immediately heated, the wound being in the meantime well pressed so as to expel all the saliva and blood possible, or it may be washed with an alkaline or soapy water, with salt and water, or pure water. As soon as the iron is ready, the parts should be rapidly dried and burnt as deeply as possible. This means is very preferable and far less painful than any form of caustic.

THERAPEUTICAL PROPERTIES OF MALT.

M. Fremy, of the Beaujon, communicates an account of the trials he has made of malt as a remedial agent. He has employed malt prepared by Nitsohke, a brewer near Berlin, which he found to be of superior quality to that obtainable at Paris; it is more soluble, aromatic, and agreeable. The malt-powder may be given internally in the form of decoction, and applied externally by means of baths. The substance was tried on sixty-four subjects of well-marked phthisis; but the results were trifling, beyond a certain degree of temporary amelioration. It was, however, of greater service in cases of chronic bronchitis, early phthisis, and chronic pulmonary catarrh, its utility being very marked in this last affection. In simple dyspepsia it is of use when the saburral condition of the tongue has been removed. In Germany it has been found to be of great advantage in the chloro-anæmia of nurses. "The powder is a true analeptic, and the bitter principle, which it owes to the presence of lupulin, renders it very efficacious in re-establishing the functions of the stomach in dyspepsia."—*Journal de Chimie Méd.*, February.

PEROXIDE OF HYDROGEN.

At a late meeting of the Medical Society of London, Dr. Richardson brought before the fellows the subject of the physiological and remedial properties of the peroxide of hydrogen. This remarkable substance was discovered in 1818 by Thénard, and although it has always attracted great attention in the chemical world, has been introduced into nearly every discussion on "ozone," and was many years

ago put forward by the Society of Sciences of Haarlem as the subject of a medical prize, it has been left to our countrymen to lead the way to the study of the subject in its physiological and therapeutical aspects. Dr. Richardson has been employed in this research for many months, and his observations in relation to the nature of the body in question, its formation for therapeutical uses, and its effects on animals, are singularly interesting. For instance, he showed by experiment that the oxidizing power of the solution of peroxide is suspended by the presence of all narcotics; thus establishing the great law advanced by Snow, that narcotism is suspended oxidation, and that every substance which, on being introduced into animals, produces narcotization has the property, either by a negative influence or by catalysis, of preventing the union of oxygen with other substances with which it is in contact, and for which it has an affinity. Again, it was shown that some animal structures, to say nothing of certain inorganic bodies, on being brought into contact with the peroxide in solution, liberate the oxygen. Fibrine has this property, and carbonic acid. A fish placed in the solution evolved the oxygen with considerable action. Physiologically, the peroxide, on addition to venous blood, gives to the blood the arterial character; it stimulates the left side of the heart to contraction, but seems to stop the action of the right side. Injected into the arteries, it restores, for a time, a condition of muscle during which contraction occurs on the application of an excitant. It also suspends cadaveric rigidity, and further, it prevents the spasms of muscle caused by such bodies as ammonia and hydrocyanic acid. Therapeutically, peroxide of hydrogen offers itself in all cases marked by deficient oxidation. In low fevers, as an antidote to various poisons, in tetanus, in diabetes, and in cancer. It is only just to say that the introducer of the remedy specially guarded himself from offering any extreme views; he claimed simply that a substance possessing such singular properties, physiologically, should be used rationally as a medicine in extreme cases for which we now have, virtually, no means at command. This is a fair mode of putting the matter, and if the peroxide prove essential in the cure of but one disease, the physiologists may at last rebut the charge that their science does nothing for treatment, and that in the midst of their learning they are obliged to leave remedies to the empiric and the wheel of fortune.

THE VETERINARIAN, MAY 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

THE SUPPLY OF CATTLE PATIENTS TO CENTRAL VETERINARY INFIRMARIES AND SCHOOLS.

The practical application of the science of medicine to the treatment of the diseases of cattle and sheep in a scholastic institution is a *desideratum* devoutly to be wished for. However valuable the inculcation of principles may be, none can doubt that this would rise in proportion as the pupils had the opportunity of studying disease by a daily attendance on patients of this class. The means of obtaining them is, however, a question beset with difficulties far greater than would be supposed.

It might reasonably be thought, now that England is covered with a network of railways, all of which converge towards London, that a central infirmary here placed would be filled to repletion with the sick animals of the farm. The Royal Veterinary College, however, in common with every other institution of the kind in Europe, finds that the advantages it affords for the treatment of diseased cattle are not made use of to the extent they ought to be by the agricultural community. Men who are the sincere friends of the veterinary profession, and the earnest advocates of the extension of medical science, prefer, nevertheless, to keep their sick cattle at home, rather than incur the risk of their loss at a distance. A low charge, or even no charge for treatment, added to the zeal of such persons, is not a sufficient inducement to tempt them to depart from their accustomed course.

The truth is that it is not the distance, nor the trouble, nor the expense, nor the want of confidence in those under whose care the animals would be placed, which is the ruling motive; but that an opportunity is lost, by their removal from the farm, of turning them to a profitable account in the event of the disease assuming a dangerous character.

The inspectors of markets, valuable as are their services, can never entirely prevent the sale of even visibly bad meat; and in many of the cases to which we have reference they are perfectly powerless, simply because the evidence afforded by the carcass is not sufficient to prove that the animal was slaughtered in consequence of illness. Many a disease of brain, lung, heart, liver, stomach, intestines, and other organs, although dangerous to life, leaves no trace of its existence in the flesh, from which alone too many of these men judge. Doubtless an inspector, possessing a veterinary medical education—and such only should be appointed to the office—would be enabled to detect the footprints of the destroyer, where other persons, perhaps, gave welcome to the approach of a supposed friend.

Our object, however, is not now to call attention to the inspectorship of markets, with a view to its improvement, but to allude to the difficulties that stand in the way of a supply of patients to a central cattle infirmary. This difficulty, we have said, does not belong to England alone, but is common also to the Continental schools, and hence varying expedients, some of which cannot be adopted here, have been had recourse to for its removal. These schools are all under government management, and centralization can often give that which divided power has no means of bestowing. But for this cause, not only would the hospitals belonging to many of these schools lack *bovine* patients, but *equine* also, for the supply of the latter often comes almost entirely from the army. To meet to some extent the necessity of the case, the authorities of the Brussels school long since endeavoured to teach one important division of cattle pathology, namely, parturition, by models of life-size, formed on such plan as to allow of the representative fœtus being placed in varying positions akin to those occurring in actual practice. This, no doubt, is useful in its way, and might be advantageously imitated by us, but something far beyond it is required to make veterinary pupils cattle practitioners.

While we write, an important discussion is taking place between the Royal Veterinary College and the Royal Agri-

cultural Society for the removal of the difficulty complained of. It is gratifying to see that both institutions are harmoniously co-operating, as this argues well for the success of any scheme which may be propounded. Agriculture and veterinary science are so mutually dependent upon each other, and their success so identical, that nothing must be allowed to weaken the bond which unites them together. We have no fear of this while the interests of each are so well presided over as they now are by those who represent the two institutions.

Has not the time arrived for some bold step to be taken? The contemplated removal of the dairies out of London should not be lost sight of; and if this be not carried out, surely something might be done with the existing establishments. Dairies are attached to some of the veterinary colleges of the Continent, and these, when on a sufficiently large scale, yield a fair amount of practice to the students. It is, however, a practice of one description only; not sufficiently diversified to meet every necessity, although most valuable as far as it goes.

If possible, veterinary pupils should see the management of cattle, sheep, and pigs, on the farm, and study the ordinary causes of diseases as they are in daily operation. Every farm, in itself, is an important field of education for the student of veterinary medicine, although some may be better suited than others for his particular requirements. Dairy farms offer the greatest advantages, and ere long these must be multiplied in the vicinity of all large towns, and London in particular.

We ourselves are not, however, prepared just now with any special scheme, for we must view this question from several aspects, and hence observe its varying features. Our province is rather to throw out hints for others to act upon, and beside these now given others are in store. Will our readers take up this important question, and favour us with their counsel? The future position of the veterinary profession depends very much upon what is now done.

ELECTION OF M. MAGNE, DIRECTOR OF THE ALFORT SCHOOL, TO THE IMPERIAL AND CENTRAL SOCIETY OF AGRICULTURE.

In our last number we announced that M. Magne had been appointed director of the Veterinary School at Alfort in the place of the late M. Delafond.

We now learn from the *Journal des Vétérinaires du Midi* that the Imperial and Central Society of Agriculture has also just elected him a member of that body, thus supplying the vacancy created by M. Delafond's death. The editors of the journal, in alluding to this circumstance, observe that in congratulating him on this appointment, they cannot but express their surprise that so long a time should have been allowed to pass without opening the doors of the society to the new director of the Alfort School, to which, for some time, his numerous works on agriculture and veterinary science had justly entitled him.

REPLY TO THE ADDRESS OF CONDOLENCE TO HER MAJESTY.

We have been favoured with the following copy of the letter received from Sir G. Grey, in reply to the address of Condolence presented to Her Majesty by the Council of the Royal College of Veterinary Surgeons, to which we have much pleasure in giving insertion.

"Whitehall; *Feb.* 8, 1862.

"Sir,—I have had the honour to lay before the Queen the loyal and dutiful Address of the President, Vice-Presidents, and Council of the Royal College of Veterinary Surgeons, on the occasion of the death of His Royal Highness the Prince Consort.

"And I have to inform you that Her Majesty was pleased to receive the Address very graciously.

"I am, Sir,

"Your obedient Servant,

"The Secretary to "G. Grey.

"The Royal College of Veterinary Surgeons,

"10, Red Lion Square."

Extracts from British and Foreign Journals.

POISON-PROOF ANIMALS.

There are many cases on record of mites and insects having been found living on irritating vegetable substances. Cayenne pepper, ergot of rye, ginger, &c., are peculiarly liable to their attacks. But it has been considered that in these cases the starchy and soft fibrous matter only has been eaten, the active principle being rejected. Recent observations, however, would seem to indicate that these animals not only partake of each constituent of the food, but will subsist on such actual undiluted alkaloids as strychnine and morphine.

In the course of a microscopical examination of the saline efflorescences which often form on the surface of the ordinary vegetable extracts used in medicine, Mr. Attfield, Demonstrator of Chemistry at St. Bartholomew's Hospital, met with several colonies of little animals. Entomologically, these minute beings were very interesting; for, on the authority of Mr. Busk, F.R.S., three of the groups examined were decided to be members of two new genera, and probably three distinct species, of *acari*. But other curious facts seemed to be indicated by the circumstances under which these mites were living. Some were thriving on extract of colocynth, others on taraxacum, and many on extract of nux vomica. Now, considering that all extracts have once been liquid, and are therefore perfectly homogeneous, the conclusion is irresistible that an animal, however minute, must, in taking a mouthful of such food, be partaking of a portion of every constituent; and that an acarus, therefore, in eating nux vomica must be swallowing strychnine. But to prove incontestably that mites live and thrive upon food that is to man a deadly poison, Mr. Attfield secured some lively, growing specimens from the nux-vomica extract, and, after searching them under high magnifying power, in order to be certain that no extract was accidentally adherent to their bodies, confined them singly in glass microscope cells, some with strychnine to feed upon, others without food of any kind. In less than two days the foodless ones were all dead, killed doubtless by starvation; while those supplied with strychnine were at the end of two months as lively as ever, and had, of course, increased in size. Another curious fact concerning these remarkable creatures is their utter indif-

ference to the quality of food presented to them, each species partaking of strychnine, morphine, or cheese, with equal avidity.

A concise answer to the question, What is a poison? really seems more difficult than ever. Men gradually habituate themselves to the use of opium, tobacco, &c., till their daily dose is sufficient to kill from two to ten of their own species. Sheep have been known to consume unwholesome plants till their flesh has become uneatable. Goats will feed on hemlock, hedgehogs swallow almost anything, and the common toad cares little for hydrocyanic acid. Ultimately we come to the acari, which appear to enjoy a perfect immunity from the usual effects of a so-called poison; for here strychnine is only a poison in the same sense that starch would be poison to man, namely, in that it does not contain every element necessary for the reproduction of tissue. These facts seem, Mr. Attfield thinks, to form a chain of evidence more or less wanting in certain links, but which appears to indicate that a so-called poison is only a poison when the animal taking it is unaccustomed to it, or when the amount swallowed is far larger than that usually taken into the system.

Pliny says that Mithridates the Great was the object of so many conspiracies during his minority, that by means known only to himself he rendered his system poison-proof. This is treated as a fable, but in the theory of Mr. Attfield the nearest approach to that condition might have been effected by continuously taking gradually increased doses of poisons.

WHAT CONSTITUTES UNWHOLESOMENESS IN MEAT?

It is rather an important thing to know at what time after any given disease from which an animal has recovered flesh may be pronounced fit for food. We all know how commonly the human subject is affected with pleuro-pneumonia, and how frequently pleuritic adhesions are found after death. Are old adhesions any sign of unsoundness? or, are they not compatible with an entirely healthy composition of fresh blood? We know, as matter of fact, that the flesh of animals affected with pleuro-pneumonia is sent to market in three stages: first, so soon as the animal is seized with the illness. Many a shrewd farmer sends his beast to his butcher on the very first signs of disease, before important local changes have occurred, and before general emaciation. In this stage we are not aware that any proof has been offered

of ill consequences from eating the meat, though we should not choose such meat knowingly. Secondly, during the height of the disease, when the inflamed part is loaded with exudations, which have a tendency to decompose even within the living body, and when all the muscles are emaciated and *wet* from serous effusion; at this time the use of the flesh would be disgusting. But supposing that the animal recovers, that the exudations are absorbed, leaving only the solid parts in the form of common *adhesions*, and that the universal muscular system recovers tone, colour, and plumpness; shall the flesh be condemned on the ground of the pleural adhesions, the vestiges of past and cured disease? So Dr. Letheby seems to think, if we may judge from the police reports. The carcase of a sheep was seized on the ground that it "had suffered" (we quote from the *Times* of the 3rd instant) "from the lung disease, as was evident from the outer membrane of the lung having adhered to the inside of the carcase, which rendered it unfit for food.

"*Dr. Letheby*, the medical officer, said that a sheep afflicted with lung disease would be affected throughout the whole body, so as to render it unfit for human food, and even dangerous to the consumers of such meat as food. Meat would be equally unfit for food if the animal had been overdriven so as produce inflammation.

"Several salesmen of great experience were called for the defence, who stated that a large number of sheep that come to market were affected in the same way as far as the appearance of the lungs adhering to the carcase went, and that the meat was none the worse for it. The inspectors admitted such to be the fact, but added that in such instances the disease had not reached the same advanced stage. At this point of the case the carcase of the sheep was produced in court, and astonished every one by the wholesome appearance of the meat. A shoulder of the sheep was cut off and passed up to the bench for the magistrates' inspection, upon which Alderman Humphrey said the meat appeared good enough, and he should not object to eat it had it been placed before him; and he thought if all meat as bad as that were seized, half the meat that came to market would have to be condemned.

"*Alderman Finnis* said he certainly could see nothing amiss with the joint before him, or with the external appearance of the carcase generally.

"*Dr. Letheby*, when asked to point out the indications of disease in the shoulder, said he could not do that, as that was the part which was not affected by the disease.

"*Mr. Wontner* reminded him that he had stated that the whole of the animal was affected, whereupon

"*Dr. Letheby* said the whole of the animal was, no doubt, affected by it, but it was not so easy to point out the disease in the shoulders.

"*Mr. Wontner* said Mr. Bonsor did not contest the order on account of the value of the sheep, as he was only the salesman. A very important principle, however, was involved, which would affect every salesman in the market, and every grazier in the country most seriously; for it was a well-known fact that half the sheep that came to London presented the same appearance when killed. Inspector Newman had been a baker, and Inspector Davidson a hair-dresser, before following their present occupations. They could not possibly have the same practical knowledge that salesmen and butchers had. With regard to the meat in question, it had been sold to one of the witnesses present at a sound meat price, and he was even then willing to take the carcase away at the same price. It had also been seen by the other inspector of the market (Fisher), who had pronounced it good, sound meat. Under these circumstances he trusted the Court would not make the order.

"*Alderman Finnis* said the disease was apparent on the inside of the carcase, and as Dr. Letheby had sworn that it was unfit for food, he could not do otherwise than condemn it."

We can but express our admiration of the keen sense of responsibility displayed by the magistrates in supporting the opinion of Dr. Letheby. For our own parts, we should most implicitly have taken the verdict of a brace of London aldermen as to wholesomeness of a joint of meat. What higher court of appeal is there in such a matter? Dr. Letheby's opinion is, no doubt, sound in theory, yet there may be room for a little discretion and common sense in the application of it.—*Lancet.*

ADULTERATION OF BLACK HELLEBORE ROOT (*HELLEBORUS NIGER*) WITH THAT OF THE BANE-BERRY (*ACTÆA SPICATA*).

Professor Bentley, in a communication in the *Pharmaceutical Journal*, states that he has frequently noticed the above adulteration to exist, and which he thinks has been overlooked. Both the plants belong to the natural order Ranunculaceæ, but their properties are very different.

He says, "It is somewhat remarkable that the intermixture of bane-berry rhizomes with those of black hellebore should not have hitherto been noticed in this country, as such an intermixture is certainly not of recent origin, for I have lately found specimens of what has been called black hellebore, and which I have proved had been in stock more than sixteen years, which consisted always entirely of bane-berry rhizomes. At present, in some instances, the whole of the drug forwarded to me as black hellebore consist of bane-berry, and in other instances I have found a large intermixture of the false with the genuine rhizomes.

"Upon a superficial examination, the resemblance between black hellebore and bane-berry rhizomes is most remarkable; but on a more careful inspection, we find marked distinctive characters, both physical and chemical, between them. Some of these we shall now refer to, and in order that they may be more readily noticed, we place them in a tabular form as follows:

"1. General Distinctive Characters.

Black Hellebore.	*Bane-berry.*
Rhizome variously twisted and knotted; and presenting on its upper surface, when of any length, short projections at intervals.	Rhizome twisted and knotted, but less so than black hellebore, and presenting on its upper surface large and long projections.
Grayish or brownish in colour, and without any perceptible red tinge.	Reddish-brown in colour.
Internally of soft texture, and medullary appearance.	Dense and woody internally.
No marked odour in a dried state.	Odour somewhat narcotic, especially when freshly dried or moistened.
Taste bitter, very acrid, biting, and nauseous, more especially so if freshly died.	Taste bitter, but very slightly acrid, even when in a fresh state.
A transverse section of the radicles exhibits an undivided, or but very slightly stellate meditullium.	A transverse section of the radicles exhibits a meditullium, in which the woody bundles are arranged in a cruciate, triangular, or more or less radiate manner, according to their size.

"The best of all the distinctive characters alluded to above, and one which with ordinary care will at once enable any one to distinguish with facility the two rhizomes, is that presented by the transverse sections of their respective radicles.

"2. Chemical Distinctive Characters.

"An infusion, made by macerating one ounce of black

hellebore and bane-berry separately in thirty ounces of boiling water, exhibited the following distinctive chemical reactions:

	Black Hellebore.	*Bane-berry.*
Solution of Perchloride of Iron.	Only a slight change of colour, and generally no marked percipitate.	Deep bluish or green-black colour, and abundant precipitate.
Solution of Sulphate of Copper.	No perceptible change during the first five minutes.	No immediate change, but in the course of a minute or two the infusion becomes cloudy, and soon deposits a dirty-brown precipitate.
Solution of Chloride of Barium.	No marked change.	Brownish precipitate.
Solution of Chloride of Lime.	Colour of infusion soon destroyed.	Colour of infusion deepened, and a brownish precipitate formed.

"The above chemical reactions will, no doubt, vary to some extent in different specimens, but as I have tried them in several instances, I have no reason to doubt but that they will be found essentially as I have tabulated them. It is always desirable, however, in testing a vegetable substance, to try more than one reagent."

THE PRINCIPLES WHICH REGULATE THE BREEDING OF FARM STOCK.

By Henry Tanner, M.R.A.C., Professor of Agriculture and Rural Economy, Queen's College, Birmingham.

Prize Essay.

(*Continued from vol.* xxxiv, *p.* 723.)

Production of Milk.

The milking character of our various kinds of stock takes a wide range even amongst females of the same class. Apart from the influence of food, we may remark that the quantity of milk secreted depends upon the supply of blood which the mammary glands receive as well as upon their activity, whilst its quality is mainly dependent upon the internal organism of the animal. We find, as a rule, that those domesticated animals which exist under circumstances most

nearly approaching to a state of nature possess the greatest tendency to produce milk. The formation of milk is a provision of nature to supply food for the young offspring; it precedes the birth of the young animal, and is generally most abundant in those animals which breed most freely. If however, by domestication we produce an animal possessing peculiar qualities which differ from the natural character of the dam in its wild condition, then the powers of reproduction are decreased and the energy of the system is also reduced for the formation of its accompanying product, milk. Although these two points of character—viz. a disposition to breed and an aptitude for the secretion of milk—usually increase and diminish similarly, yet there are good reasons for believing that, like other functions of the animal organism, we may materially increase the formation of milk even when the breeding-powers are naturally weak. In producing animals which differ materially from the type of the animal in its wild condition, we find that natural barriers present limits beyond which we cannot pass, and consequently by degrees we approximate to instances of barrenness in the offspring. To meet this difficulty we have to adopt measures for giving increased vigour to the system, or, as we commonly term it, to strengthen the constitution of the animal; but what are the measures adopted for this purpose other than allowing the natural habits of the animal to exert their legitimate influence? in fact, retracing some of the steps previously taken in excess.

The formation of milk we have more under control than the powers of reproduction; for when the mammary glands have been brought into a state of activity by the birth of a calf or other young animal, then the continuance of the flow will be influenced by the hereditary character of the parents as well as by judicious management. This hereditary influence must not be viewed as confined to the female, for I have not the slightest doubt on my mind that the constitution of the sire tells powerfully upon the offspring in this respect. A bull, the produce of a good milking family, has a tendency to convey this disposition to his offspring, and greatly to strengthen similar tendencies which may be hereditary on the side of the dam. On the other hand, the use of a bull descended from a bad milking-family leads to the rearing of a class of stock possessing less value for the production of milk. In too many cases bulls have been preserved for use in ordinary dairies simply because of their symmetry or tendency to fatten, without due consideration of the milking character of their ancestry. With regard to

sheep, also, I remember a very striking instance of the loss of milk in a flock (previously celebrated for their supply of milk) being traced entirely to the use of a very well-formed ram, bred from a ewe singularly deficient in milk. In this case all his stock to the second and third generations possessed or imparted this undesirable character. A large proportion of the losses in our flocks and much of the additional labour and expenses occasioned by ewes being short of milk may be traced to this cause. This deficiency of milk amongst our ewes is becoming a serious evil throughout the country; one, no doubt, which has accompanied the introduction of high-bred sheep—rather, let us hope, by oversight than as a necessary consequence. Amongst all classes of stock—cows, ewes, and sows—we find a great disposition for the accumulation of fat usually attended by a deficiency in the flow of milk; but there does not appear to be any reason why both of these points of character should not be combined in the same individual, as we shall subsequently consider more fully.

The quality of the milk bears an important relationship to the quantity which an animal produces. The richness of milk depends upon the quantity of the fatty matter present, which is more familiarly known as cream and butter. The general structure of the animal body, together with its mode of living, also appear to control the value of the produce. For the production of a rich milk two qualifications are necessary in the animal.

The first step is to separate and prepare the fatty and nutritious elements of food, so as to introduce it into the circulation with as little loss as possible.

The second step is to separate a large proportion of these elements in the form of rich milk.

Any circumstance which causes a waste of the fatty and nutritive iugredients in the food necessarily causes the milk to be of inferior value. It is exactly the same with the formation and preservation of the fatty matter of the blood, whether its subsequent appropriation be as the fat of milk or the fat of the body; for that animal which can most economically convert the fat-producing matter of food into the fatty matter found in the blood has most successfully accomplished the first step. In the fattening of a bullock, as well as in the feeding of a milch cow, the fatty matter of the food has to be taken up into the blood, and it depends upon the organism of the animal whether it shall be subsequently deposited in the form of fat or excreted as the cream of milk. It is, however, evident that an economical preparation of the

materials of the food is equally important for the formation of the fatty matter of the blood, whatever may be the form into which the animal system may convert it; and for this reason those animals which are best adapted for fattening are also best prepared to fulfil the first condition essential for the production of rich milk.

We have now to consider the influence of the animal system upon the rich fatty matter circulating in its blood. The formation of milk is primarily dependent upon the activity of the mammary glands, which are naturally excited to action a short time prior to the birth of the offspring. The energy of these glands is naturally superior to the tendency which the animal possesses for the formation of fat; so much so, indeed, that when the food is deficient in oily matter fat which has been already formed is sometimes taken up again into the circulation and separated by the mammary glands in the milk. Thus we find that when these glands are acting in a healthy and energetic manner the fatty matter of the blood is freely separated by their agency, and we have a rich milk produced. In very many instances these glands have assumed an unnatural and torpid condition, have become less susceptible of the energy usually imparted by the birth of offspring, and have been influenced by it for a shorter period of time. In such cases, although the food may have been well prepared and the blood may travel through the vessels of the glands richly laden with the elements of milk, yet, from their torpidity, they may fail to appropriate it as milk, and the blood may pass on to yield its treasure to other parts of the body. Our great endeavour should therefore be to encourage a more active condition of these glands. These organs, in common with other parts of the system, are subject to hereditary influence, and much may be done in this direction to stimulate them to the performance of their natural functions, whilst a neglect of this agency will increase and perpetuate an evil which considerably reduces the value of much of our breeding-stock. Not only may we hope that by judicious management these organs may again be raised to their natural standard of efficiency, but, like other parts of the animal system, become even more highly developed under the fostering care of man. Instances are by no means rare in which we observe in happy combination an aptitude for the formation of fat with sufficient energy of the mammary glands to produce a liberal supply of milk. Generally, in the case of cows, those that produce butter freely are subsequently found profitable for feeding for the butcher. With ewes thus distinguished the lambs thrive without extraneous

supplies of milk, and they are equally disposed for laying on fat when no longer intended for breeding. This combination is equally observable in sows of a like description, which produce large, healthy, thriving farrows, and make a good return for the food given them.

Formation of Meat.

When the object to be attained is the production of meat, many points require consideration. Much will depend upon the management and attention of the feeder, and in this respect it has been fully proved that it is essential for the economical production of meat that the animal should be kept in a thriving condition from its birth. Our attention, however, is here specially due to those consequences which result from the natural character of the animal. One of these is the capability of the dam to nourish her offspring, or, in other words, her power of producing a free supply of good milk, to which we have before adverted. Other points of character being equal, this capacity for the formation of milk will very powerfully influence the value of the dam for the purpose of rearing an animal especially intended as an economical producer of meat. Moreover, besides this supply of good milk after birth, we must not overlook the support given by the dam to the "fœtus in utero"—one that has many analogies and affinities to the yield of milk afforded to the young animal after its birth. A good milker will produce her offspring fatter, finer, and in better condition than a bad milker; whilst a puny calf tells us of a dam which has an overpowering disposition for the formation of fat. The importance of balancing these competitive tendencies so as to secure an adequate supply of milk is of primary importance for the economical breeding of animals intended to be producers of meat; whilst as this superior milking character is not generally possessed by high-bred stock, they would, by this rule, be set aside (in the majority of instances) as not being the best adapted for this object, and practice confirms this view. This capability of the dam to nourish and support the offspring should, of course, be accompanied by a well-formed and roomy body, capable of affording the young suitable accommodation for their development and growth.

But the chief point we have here to regard is that the progeny should have, by nature and character, a special capacity for the economical production of meat, or, in fact, be good machines for changing vegetable productions of various kinds into animal matter. Here again the evidence

of practice is very decided, as showing that our well-bred stock will produce more meat from a given quantity of food than those of inferior quality. I have shown in other communications* in what manner the system of management adopted and the peculiar conformation of the body which is possessed by all well-bred stock—whether cattle, sheep, or pigs—promote the economical production of meat. It is enough for our present purpose to record the fact that the squareness of frame, the small proportion of offal, the docile disposition, and the smallness of the lungs possessed by all animals of this description are well calculated to favour the production of the largest quantity of meat of the best quality from any given quantity of food with the least loss in its conversion. These, therefore, are most important points of character to be imparted to any animal which is simply to be used as a means for producing a certain amount of animal food. For these reasons, the dam should be well-formed, healthy, and a good milker, and the young animal should receive from its parents that conformation of body and constitution which render our high-bred stock such economical producers of meat. These are, however, in some degree antagonistic requirements; for, as we have before seen, those animals which possess a strong tendency for the formation of fat are not generally remarkable for being good milkers; yet such a combination is desirable if it can be attained, and the two objects are not irreconcilable. Practically, there will be no difficulty in selecting a well-formed healthy female, capable of nourishing her progeny in a satisfactory manner, and we must endeavour to communicate to the offspring those necessary qualifications which are deficient in the female by means of the sire. To accomplish this result, a male should be selected which has been very carefully bred, and whose ancestry during several preceding generations has possessed those qualifications which distinguish well-bred stock as economical producers of meat. Such a male, in consequence of such parentage, will have concentrated within him powers of transmitting this character to his stock proportioned to the length and purity of his pedigree. If this male were put to a female possessing hereditary powers of less powerful character, it is manifest that the male will have the greatest influence upon the offspring and impart to it a similar disposition for rapid feeding to that which it possessed. In this manner we can transmit from the male the predisposition to

* 'Journal of Highland Agricultural Society,' No. LXIX, p. 321. 'Journal of Bath and West of England Agricultural Society,' vol. vii, p. 57.

form meat economically, whilst in the female we have secured the means for bringing this character to the fullest and most vigorous development. The more fully these characters are possessed by the parents respectively, the more perfect will be the result. It is desirable that the female should not only be competent to produce and freely nourish her offspring, but also that she should not possess strong hereditary powers to oppose and counteract the influence of the male. The male should have the guarantee of a well-guarded pedigree for that unstained unity of character which by its concentrated energy is so influential upon the offspring.

Some may, however, anticipate that a similar result would be attained by breeding from a very well-bred female by means of an inferior male. This, however, would not be the case, and a moment's consideration will show the cause of this variation. In the former case we have a female capable of fully developing and nourishing her young, more certain as a breeder, more hardy in constitution, and consequently more free from the seeds of disease than in the latter. On economical grounds also the contrast is great, for by the one plan you require but one valuable and expensive male animal, whilst under the other system each of the females has to possess this pedigree value. We have, therefore, every inducement to breed from females well adapted to produce the finest offspring, and to use male animals capable of imparting those qualities which all will admit are desirable for the production of meat. This is no new principle, for it was advocated more than twenty years ago by the late Lord Spencer, who in the first volume of the 'Royal Agricultural Society's Journal' has recorded his conviction that the worse bred the cow may be the more fully will the calf resemble the bull. An instance illustrating this principle came under my notice while I was inspecting one of the late Duke of Bedford's well-managed farms. I was very much struck with the superior quality of about 100 or 120 store pigs, as much alike as possible, and all admirable in form and condition. I expressed a wish to purchase some for breeding, but I was told, in a reply, characterised alike by candour and sound judgment, "valuable as they are for feeding, they are worthless for breeding." Great as was my first surprise, no explanation was needed when I saw the parents. The boar was exceedingly well made, and very fine in quality, with a most careful pedigree, whilst the sows were large, coarse, and ugly, but excellent breeders and good milkers, thus producing large farrows and pushing them rapidly on towards maturity.

An interesting communication appears in the Journal of

this Society (vol. xiv, p. 214), from M. Malingré-Nouel, bearing upon this subject. He introduced into France some of our choicest English rams for the improvement of the native breeds of sheep, but the lambs obtained were in no way improved by their use. By long-continued breeding in and in, the French ewes had hereditary tendencies far more powerful than those of the English rams, which rendered the influence of the latter quite inoperative. As soon, however, as some ewes were obtained by crossing different native breeds, the hereditary power became reduced to a very low degree, and the lambs subsequently produced by the English rams partook so closely of the character of the sires that they were considered by good English judges to have been pure-bred sheep from England.

For the economical production of beef the best stock will be obtained from good useful dairy cows by the use of bulls of thoroughly good pedigree. Indeed, I may observe that a bull can scarcely be too well bred or too good for such a purpose, provided that the natural vigour of the system be not sacrificed. The quality and influence of a bull determines the value of a large number of bullocks, and it becomes a matter of considerable importance to the breeder thus to impart to these a superior feeding character. When this influence is fully appreciated we shall not find bulls valued as so much beef, but rather as the communicators of certain feeding qualities which will render their numerous offspring either profitable or unprofitable to the grazier. In the case of sheep, a good supply of milk materially affects the value of the lambs; and too much care cannot be taken to preserve and encourage this excellent disposition. Combined with this the ewes should also possess hardy constitutions, and thus be capable of rearing healthy and thriving lambs. The ram should regulate the increase of quality, which must be discreetly governed by the local peculiarities of climate. The parentage of the ram should be investigated with equal if not greater care than his symmetry and general quality.

There is no variation from these rules even in the breeding of pigs. Here let the boar be distinguished by good quality and careful breeding, and the sow able to rear a numerous progeny to a high degree of perfection. Thus will a class of stock be produced eminently adapted for the economical production of meat.

Purity of Breed.

The production of animals for maintaining and perpetuating the pure breeds is a course of practice distinct from either of

the preceding systems which we have noticed. In these the production of milk and meat respectively modified and regulated our proceedings, but for the present purpose we have to produce fixity of type, and to this end we must select animals possessing the same characteristics and the same affinities, that in each succeeding generation the same stamp may be the more deeply and indelibly impressed upon the offspring. When there is any bad point of character to be overcome it is only to be accomplished by persevering in the use of a parent having, if possible, an opposite tendency, or at least as little as may be of that which is objectionable, by which means the evil, if not subdued in the first generation, will be gradually corrected by judgment and perseverance. The subsequent course of procedure will aim at rendering the character thus acquired as permanent as possible. Every generation will have the special character of the breed more and more powerfully concentrated, and consequently will be more competent to render these qualities hereditary. We have before seen that the influence of the parent upon the offspring is dependent upon the relative powers possessed by each individual. In the case of pure-bred animals there should be no opposing influence to weaken the hereditary tendencies of the offspring, but on the other hand a concurrent and sympathetic nature, so that the hereditary character may be confirmed and strengthened. Anything like a cross should be most jealously guarded against as introducing a conflict of influences, which impairs the character of the race.

It may, however, be said that if we do not get fresh blood we lose size in our stock. This sacrifice is greater in appearance than in reality, for presuming the opinion to be correct that the food consumed by animals of equal quality bears a regular proportion to their live weight, and there is good reason to believe that such is the case, then it is clear that the loss of size does not render the consumption of food less economical. This diminished size does not appear in any way to prejudice the stock produced when such sires are used with females of inferior quality having a good supply of milk. If we could breed in the same line and yet not lose size, it would be decidedly advantageous, This is a difficulty which the producer of pure breeding stock has to combat to the best of his judgment and discretion; but on no condition should size be gained by any stain in the pedigree. It were better to allow the diminished size to continue, for to maintain it at the cost of pure descent would be to sacrifice the main object in view. To meet any drawbacks attendant upon

this maintenance of purity of breed, this stock should bear such a value, and bring such remunerative prices to the breeder, as to indemnify him against risk and losses, and open a fair prospect of profit. The decrease of size may, like every other point of character, be influenced by discretion in the management. An instance occurs to my mind of a celebrated breeder of sheep who was noted for maintaining size with great purity of descent. He made an invariable rule of purchasing his rams from a most carefully bred flock, and for twenty-two or twenty-three years—in fact, up to the time when he gave up business—he never introduced any other blood, but he was exceedingly particular in selecting the largest rams, being satisfied that, whether large or small, all possessed an equally pure pedigree. His extended experience thoroughly convinced him that his system was correct.

It has been judiciously remarked that it is much easier to bring any breed to the highest state of perfection than afterwards to maintain it in that position. The difficulties are undoubtedly great, but observation shows that they are not insurmountable. The relative advantages of breeding in and in and breeding in the line have scarcely been determined, but it is a subject worthy of consideration. Mr. Pawlett, a ram breeder of high repute, and the author of an 'Essay on Sheep,'* says—

"From a long experience and close attention to the subject for more than twenty years, my mind seems more disposed to favour breeding in and in, rather than changing from one flock to another. I do not recommend that animals closely allied should be put together generally, yet I have known a very good sheep, for instance, produced by putting the son of a ram called A to a daughter of A in cases where their points would suit each other, and I should never hesitate to do so."

Mr. Robert Smith, whose reputation as a ram breeder is equal to that of Mr. Pawlett, and who is the author of the 'Prize Essay on Sheep,'† takes a very different view of this question, and says—

"With crossing and breeding in and in I have been lamentably disappointed, there being no dependence on the first, and no size to be procured in the latter. Even in 'breeding in the line' much depends upon the union or knowledge of matching the male and female, particularly if selected from different families even of the same race, which have been for some time raised in other localities, and consequently influenced by climate, soil, situation, and treatment. When using rams of the same flock they should by no means be used nearer than a *third* remove in the same line of

* 'Journal of the Royal Agricultural Society,' vol. vi, p. 362.
† Ibid., vol. viii, p. 25.

blood. I have, by repeated experiments, experienced by the nearer affinities of blood the most decided disappointment, but have raised some first-rate animals by putting together the third removes when attention had been previously paid to the sort required."

In the former case the ram A stands in the relationship of *sire* to the two sheep to be bred together; in the latter case he stands as *grandsire* to both. In this way, by *diverging* from a favorite sheep, we again converge, and probably produce one or more sheep of the utmost value to that flock, as presenting some distance in relationship without any sacrifice of family merit.

With all the advantages derivable from breeding stock with good pedigree and great fixity of character, we find that not only are good qualities thus concentrated and rendered hereditary, but also others of less desirable character which may have been possessed by the parents. Thus we have in many cases a delicacy of constitution and a want of energy in the system, which is too commonly looked upon as a necessary result of high breeding, but I am inclined to believe that these results are much more referable to the system of management pursued. The delicacy imparted to stock by too much protection through the winter months in warm sheds and buildings, whereby they get glossy coats, ill prepared to resist atmospheric influences when they are turned out to grass in the spring, render such stock peculiarly delicate. This delicacy, when continued for several successive generations, becomes constitutional and hereditary. A moderate exposure to the cold of winter and plenty of exercise will enable cattle of the purest breed to keep a good, rough coat, and although they may need more food, still this is a sacrifice perfectly insignificant in comparison to the advantages gained by strengthening and invigorating the system, instead of fostering a relaxed and enervated condition of body. Well-bred cattle reared in this hardy manner possess far more vigorous systems, and it should be remembered that whilst we concentrate in our stock valuable powers of hereditary transmission, these only become available in proportion as we preserve in them that vigour of health which will enable them to communicate these influences. The capability of stock for breeding is much reduced by the enfeebled condition of the body induced by rendering them delicate. This unfavorable influence is seriously increased by the general course of management now adopted, and the evil accumulates in a greater degree with every successive generation. An excessive quantity of fat in either of the parents is also unfavorable to the exercise of the breeding

powers. These, however, are matters of detail which should rather be noticed under the general management of stock, but I have made reference to them because it is essential that breeding animals should not only possess certain points of character which are desirable for transmission to their offspring, but that they should also be in that vigorous state of health which will enable them to produce healthy descendants. It is no uncommon circumstance for well-bred stock to be drafted from the herd as incapable of breeding, which, when put to males of inferior breed, are found to be prolific. Much of this, doubtless, arises from a want of vigour of body induced by a debilitating course of treatment, which would have been prevented by active exercise and a system of management calculated to promote health.

The accumulation of those hereditary tendencies which are most suitable for the circumstances of each individual case is in a great measure under our control, but it must still be looked upon as only one portion of a general system rather than as embodying all that is necessary. It is an important adjunct to other points of good management which are of great value to the breeder if judiciously employed, but at the same time all his efforts in this direction will be of no avail unless assisted by his general course of management. Valuable as a good pedigree may be when combined with a healthy and vigorous body, when the latter is sacrificed to attain the former, the value of pedigree is questionable. By avoiding excessive fatness in our breeding animals, by encouraging exercise and moderate exposure so as to favour the health and energy of the body, and by giving a liberal but regularly progressive supply of food, we shall best prepare our stock for being recipients of those hereditary powers to which I have here made reference.—*Journal of the Royal Agricultural Society of England.*

ON THE SCOURING LANDS OF CENTRAL SOMERSET.

By Dr. Augustus Voelcker, Royal Agricultural College, Cirencester.

Report of an Investigation made at the request of the Council of the Bath and West of England Society.

(From the *Bath and West of England Agricultural Journal.*)

Scouring lands, though by no means confined to the lias formation, occur most frequently in localities where heavy, tenacious, dark-coloured soils rest upon yellow or

blue lias clay. Central Somerset unfortunately abounds in pastures which are "tart," and exhibits this peculiarity in a very characteristic and virulent manner. Many of the upland and border pastures on the northern side of the Polden Hills, and immediately skirting the moors forming the great Brue Level, possess in a high degree the property of scouring cattle, more especially dairy cows during the summer months. The Polden Hills, indeed, are notorious for the prevalence of scouring land. Such land occurs to the east of the district just mentioned in the direction of Pilton, Pennard, and Shepton Mallet, but in the northern and western parts of the county scouring pastures are rarely found. Some of the worst land in this respect, I understand, may be found in the parish of Cossington, on the northern side of the Polden Hills. To this locality my attention was particularly directed; I therefore visited this district last summer and personally made inquiries into all the facts and local opinions deemed likely to throw light on the cause or causes of this mysterious peculiarity, which more or less prevails in the neighbourhoods of Walton, Shapwick, Edington, Baltonsborough, Pennard, Pylle, Barton St. David, Paddimore, Load, Othery, Burtle, Butleigh, Street, Edgarly, and other localities.

Scouring land, however, is not confined to central Somerset, nor to blue lias clay; for in Gloucestershire and other counties scouring pastures here and there occur. Thus in the neighbourhood of Cirencester certain pastures exhibit this peculiarity, although they are not situated in the lias but in the oolite formation. In every instance that has been brought under my notice, however, I find that scouring land rests on an impervious yellow or blue-coloured clay subsoil, of considerable depth. Most frequently the subsoil is a true lias clay, but examples are not wanting in which scouring land rests on forest-marble clay, Oxford clay, and clays of the great oolite formation.

Respecting the cause why cattle scour during the summer months on certain pastures and not on others, many conjectures have been made and various theories suggested; but not one explanation, however reasonable it may appear in a particular instance, takes into account the multiplicity of facts which really have to be considered in forming a comprehensive and satisfactory theory on this subject. Hence, of all the explanations hitherto offered, the best are but partially true, and they are frequently irreconcilable with established facts.

Leaving unnoticed several of the more palpably erroneous

surmisings, it may be observed that the *cause* of scouring—to which cows and calves, and in a minor degree horses and sheep, are liable on certain pastures—has been referred—

1. To injurious substances which are supposed to exist in lias clay and scouring lands generally.
2. To defective or inefficient drainage.
3. To the drinking of water in districts where scouring prevails.
4. To certain medicinal plants, such as the *Linum catharticum*, supposed to abound on scouring land.
5. To injurious constituents of scouring herbage.
6. To the poor and innutritious character of the herbage on scouring meadows.

The critical examination of these six theories may be preceded by some facts gathered during a professional visit to some of the worst scouring land on the Polden Hills, and by several statements contained in Mr. Clarke's highly suggestive 'Prize Essay on the Scouring Lands of Central Somerset.'*

On sifting carefully the practical evidence at our command, little or no doubt, I think, can be entertained respecting the reality of the following classified facts.

a. Facts connected with the character of Scouring Land.

1. Scouring land is most prevalent in the lias formation.
2. Such land is generally *dark coloured*, and invariably rests on an impervious clay subsoil.
3. There is scouring clay land resting on similar yellow or blue tenacious clay subsoils, but not belonging to the lias clays.
4. On the other hand, not every lias-clay soil possesses this peculiarity.
5. No special analytical examination of scouring land and of lias-clay subsoils has as yet been published.

b. Facts connected with Drainage.

6. In certain seasons cattle scour on some perfectly well-drained soils, as much as on undrained pastures.
7. In other well-authenticated cases drainage was found a perfect cure.

c. Facts connected with Water.

8. Certain waters in districts where scouring prevails appear to have a decided medicinal effect on the health of cattle that drink them.

* 'Journal of the Bath and West of England Society,' vol. iii, p. 52.

9. The composition of these waters has not as yet been ascertained.

10. Soft or rain water, and the black ditch water from peaty land, are preferred by cattle to the hard-water springs of the lias.

11. The black waters from peaty soils are always soft; that is, they contain but a small proportion of mineral and saline constituents.

12. The dark colour of water from peat is not due to any astringent principle, but to compounds of humic and ulmic acids, two organic acids of humus.

d. Facts connected with Herbage.

13. No satisfactory evidence exists showing that in scouring meadows particular plants grow in abundance, which, like *Linum catharticum* (purging flax), possess purging properties.

14. The herbage on many scouring pastures has by no means the appearance of that of poor, hungry pastures, but rather the reverse.

15. It has never been shown that the produce from scouring land contains anything injurious to the health of animals fed upon it.

16. Manures appear to increase the evil in exactly the proportion in which they increase the luxuriant growth of the young herbage.

17. During the driest summer months in the year the upland herbage possesses the greatest scouring property.

18. After the first frost in November the herbage loses more or less completely its prejudicial character, and during the colder and wetter months of the year pastures affected by this evil exhibit it only in a slight degree, or not at all.

We shall presently see the practical bearing of these facts, which to my mind seem well established. They are empirical, but most of them may be explained in a simple, rational manner, and not a few can be subjected to an analytical inquiry, which affords us a clear insight into the causes of this dreadful complaint.

At the request of the Council of the Bath and West of England Agricultural Society, I visited last summer (in company with Mr. Poole, to whose kindness I am greatly indebted) some of the most scouring districts on the Polden Hills; and on that occasion I took on the spot samples of water from a stream of water from the lias cutting of the Bristol and Exeter Railway at Dunball, and from a stream of water which breaks out at Ford Farm on the south side of the hill

between the parishes of Edington and Stawell. Both these waters are known to possess scouring properties; I was therefore particularly anxious to examine them. I further took samples of scouring land situated in the parish of Cossington; likewise hay from scouring land at Meare, and hay from peaty land does not scour. These different samples and a soil from scouring land on the estate of Sir Alexander Hood at Shepton Mallet, as well as a peat soil at Meare, kindly sent to me by Mr. Poole, were carefully examined in my laboratory. The whole investigation into the causes of scouring so prevalent on certain pastures in central Somerset engaged my liveliest attention.

The analytical proofs, which require to be mentioned in support of the views entertained by me at present on the subject of this report, may be conveniently incorporated in the examination of the leading theories to which allusion has been made.

For the sake of brevity, the hypothesis which supposes something injurious to vegetation to predominate in lias clays may be termed the Geological Theory. This will claim our attention in the first place. In the next place the Drainage Theory requires examination; and the rest may be considered together under the general head of Herbage Theories.

Examination of the Geological Theory.

The question whether or not there is anything injurious or abnormal in lias-clay soils admits of a direct solution, which must be sought in the analysis of soils pre-eminently distinguished by scouring properties. Accordingly, an analysis has been made of such a soil from Mr. Rugg's farm, in the parish of Cossington. The following results were obtained:

Composition of Scouring Land from Mr. Rugg's Farm, Cossington, August, 1861.

Moisture	4·73
Organic matter and water of combination	16·57
Oxides of iron and alumina	14·26
Carbonate of lime	5·25
Carbonate of magnesia	3·67
Alkalies	1·04
Insoluble siliceous matters	54·48
	100·00

A second sample, taken from another part of the same field, yielded the following analytical results:

Moisture	7·12
Organic matter and water of combination	14·76
Oxides of iron and alumina	15·87
Carbonate of lime	2·53
Carbonate of magnesia	2·08
Alkalies	2·60
Insoluble siliceous matter	55·04
	100·00

No constituent which does not occur in good land could be detected in the preceding soils, nor are the component parts present in abnormal relative proportions.

In the next place I examined a soil from notoriously bad land, on the estate of Sir Alexander Hood, at Shepton Mallet. This soil contained in 100 parts—

Moisture	4·54
Organic matter and water of combination	14·40
Oxides of iron and alumina	14·45
Sulphate of lime	·26
Carbonate of lime	14·80
Magnesia	·96
Alkalies	·93
Insoluble siliceous matter	49·66
	100·00

This soil was rather dark coloured. The dark colour is due partly to protoxide of iron, partly to the large quantities of organic matter. Although not injurious in itself, an excess of inert organic matter, and particularly protoxide of iron, indicates a condition of the soil which is not favorable to the healthy growth of plants. In a porous, well-cultivated soil, freely penetrated by the atmosphere, the accumulation of organic matter never becomes excessive, nor does such a soil contain protoxide of iron in large quantities. The presence of the latter in considerable proportions always shows that the soil is not sufficiently aërated in order to produce a healthy and nutritious herbage. As protoxide of iron is insoluble in water, I am of opinion it is not injurious to plants, but it indicates a bad physical condition, which affects the herbage more than the chemical constitution of the soil.

The next soil which I examined was a lias-clay subsoil from Cossington. The analysis gave the following results:

Composition of a Lias-Clay Subsoil from Cossington.

Water	3·05
Organic matter and water of combination	5·11
Oxides of iron and alumina	6·98
Carbonate of lime	40·93
Alkalies and magnesia	2·96
Insoluble siliceous matter (clay)	40·97
	100·00

A large quantity of carbonate of lime enters into the composition of this extremely tenacious clay marl, but nothing peculiar, or in any way remarkable, occurs in it.

Lastly, an analysis of a peat soil from Meare gave the following results:

Composition of Peat-Land at Meare which does not scour.

*Organic matter	97.760
Oxides of iron and alumina	·536
Carbonate of lime	·855
Magnesia	·144
Potash	·131
Soda	·065
Phosphoric acid	·053
Sulphuric acid	·051
Silica	·405
	100·000
*Containing nitrogen	1·428

In its natural state this soil contained no less than 87·95 per cent. of water, which shows how large a quantity of water peat is capable of absorbing.

This soil does not scour. It contains a very large proportion of organic matter and a very small quantity of mineral substances; the latter consist of the constituents usually found in soils of that description. Apart from the excess of organic matter in the peat land, no essentially characteristic difference can be said to separate the scouring soil from the healthy peaty soil. In the immediate neighbourhood of Cirencester there are hundreds of healthy fields which, in composition, closely approach the three first-mentioned soils. It cannot, therefore, be said with propriety, that lias soils possessing scouring properties contain anything injurious, or an excess of a constituent likely to produce an unhealthy growth of herbage. Nevertheless, I am inclined to regard the *soil* of scouring land as the source from which the mischief proceeds; but the evil arises from its bad *physical condition*, and certainly not from the presence of any injurious matter in the surface or subsoil. I shall offer a few additional remarks on this point after having considered the character of the herbage of scouring pastures.

2. *Examination of the Drainage Theory.*

In the opinion of some who are well acquainted with the subject, inefficient drainage must be considered as an aggra-

vation, if not the sole cause, of the evil. Mr. Clarke, in his essay,* mentions two well-authenticated cases, and Mr. Poole† another, in which the complaint appeared to have been entirely removed by drainage.

On the other hand, it is asserted that drainage not merely is generally ineffective in curing scouring land, but that in some cases it appears to aggravate the evil. In the absence of positive proofs, it may be reasonably doubted whether drainage really increases the scouring properties of land, but it cannot, I think, be denied that it does not always, nor perhaps in the majority of cases, cure the complaint.

It certainly is a fact that in the lias formation the fields adjoining notorious scouring meadows are often perfectly sweet and sound; and that no difference as regards drainage, herbage, supply of water, and general character, can be recognised, which might account for the sound condition of a field and the scouring properties of the adjoining one.

Notwithstanding the great similarity of two such fields, I would observe an essential difference would perhaps be readily recognised if we could turn both completely over and carefully examine their subsoils. The scouring field would then be found to rest on a stiff, impervious, clay subsoil, not very far removed from the surface: and in the second field the subsoil would, in all probability, be of a much more porous character, or be found at a greater depth than that usually penetrated by the roots of grasses.

This difference in the character and position of the two subsoils necessarily must exercise a powerful influence on the agricultural capabilities of the two fields. Both may be equally well drained—both may bear to all appearance the same description of herbage—they may be identical in composition, and yet the one field may be worth a great deal more than the other. This need not cause surprise, for drainage only makes the two fields so far equal as it removes the surface-water from both; there still remains an essential difference in the supposed case. In one field we have a deeper surface-soil resting on a more porous subsoil, and in the other a less deep soil, with a stiff, impervious subsoil. It is quite a mistake to think that drainage necessarily improves every soil in a high degree. It does so in the great majority of soils. But at the same time we cannot shut our eyes to the fact, that whilst drainage often improves one field greatly and another much less, instances are not wanting in which the benefits resulting from draining are scarcely appreciable.

* 'Journal of the Bath and West of England Society,' vol. iii, p. 52.
† Ibid., p. 60.

Some people evidently think that drainage is a talisman which converts every unproductive soil into a fertile one. But a little consideration will show that the radical changes which draining usually produces in the agricultural capabilities of land cannot take place in every instance, and that the general character of scouring land is, in many cases, not affected by drainage.

Let us look for a moment at two pastures of a similar character in their natural, undrained condition. Both are wet, equally unproductive, and to all appearance there is no difference in the two fields; probably both scour. But we will suppose that in one field we have only two or three inches of surface-soil, and, under it, say three or four feet or more of tenacious lias clay, whilst in the other the same clay subsoil lies at a depth of eighteen inches, or still more remote from the surface. Though perfectly equal in their undrained condition, the greatest difference must be produced in the character of two such fields after draining; for with the removal of the surface-water in the one field only two or three inches of soil are improved, and in the other eighteen inches or more. We can without difficulty take away the surface-water equally well from both fields, but we cannot in an equal degree change their general character. If scouring were caused by an excessive quantity of water in pasture land, drainage would remove the evil in every instance; but as the scouring effects of herbage are most perceptible during dry weather, it follows that the mere presence of surface-water in a field does not account for its scouring properties.

As drainage produces radical changes in the condition of some soils, and as such changes cannot take place in soils in which a thick, impervious, clay bed comes close to the surface, we can understand why drainage cures scouring land in one place and not in another.

I am unacquainted with a solitary instance in which scouring land rests on a porous subsoil, but I know many fields in scouring districts where a deep, tenacious, blue clay subsoil comes very near to the surface. Wherever this is the case, drainage, I am of opinion, will not remedy the evil; and in particular cases I can understand that it may even aggravate it. But should newly reclaimed peat land or clay soils, in which the blue-lias subsoil lies at least eighteen inches from the surface, be found to have scouring properties, I am inclined to think under-drainage will cure the evil on such land.

3. *Examination of the Water Theory.*

It has been stated by trustworthy authorities that certain waters in the lias formation possess scouring properties. Two statements by Mr. Poole deserve particular attention. In his note to Mr. Clarke's paper,* Mr. Poole says: "Some years ago I carried a stream of water from the lias cutting of the Bristol and Exeter Railway, at Dunball, across Sedgmoor Drain into Horsey Slines (which the writer mentions as a district peculiarly free from this disease), and it immediately began to scour the cattle, and I was obliged to cut off the supply."

Again: "There is a stream of water which breaks out at Ford Farm, on the south side of the hill, between the parishes of Edington and Stawell, and flows through one of the offshoot moors of Sedgmoor, and which, for at least two miles of its course, viz., as far down as Bawdrip, scours the cattle in every field through which it passes. This spring is a strong petrifying spring. The scouring properties of the water are so well known that the watering-places on the course of the stream are frequently fenced off by farmers to prevent their cattle from drinking at them."

Mr. Clarke likewise mentions two cases. "In one instance," he says, "a large piece of pasture-land was found to scour the cows kept upon it, to the great loss of the occupier, until he hit upon the expedient of cutting off the supply of spring-water from a neighbouring brook, and confining the supply to the rain-water held in the ditches, the result of which has been that very little of the disorder has since appeared upon the land referred to. The other instance was that of a field upon the peat-soil, which is not naturally liable to scour. But during a particularly dry summer the water from a brook, issuing from the blue lias clay, having been let down into this field for drinking purposes, the cattle immediately became affected with a similar disorder to that produced upon the scouring lands."

Mr. Bush, of Weston, near Bath, also informs me that in the parish of Kewstoke, near Weston-super-Mare, there is a piece of land situated upon the moor, close to the north side, the land adjoining being lias; a spring of water rises on the lias, and, till recently, flowed in an open ditch across this field. The tenant frequently found his cattle scour when in the field. About two years ago he conveyed the water across the field in pipes, since which the scouring has ceased, and he attributed the scouring to their drinking the water.

* 'Journal of the Bath and West of England Society,' vol. iii, pp. 60-1.

In the face of these well-authenticated facts we cannot reasonably doubt that certain waters in the lias formation possess scouring properties.

I was anxious, therefore, to ascertain whether lias-waters have an abnormal constitution, and to this end I myself collected some of the water from the lias-cutting at Dunball, and from the spring at Ford Farm, to which reference is made in Mr. Poole's note. Both were submitted to careful analysis, which furnished the following results:

Composition of Water from the Lias-cutting at Dunball.

An imperial gallon evaporated to dryness gave—
202·02 grains of solid residue (dried at 300° F.)

This residue contained—	
Organic matters	·96
Mineral saline matters	204·64
Consisting of—	
Lime	60·48
Magnesia	12·20
Potash	2·39
Soda	12·29
Sulphuric acid	91·40
Chlorine	11·20
Carbonic acid and loss	10·10

These constituents, united together in the compounds which in all probability existed in the water, give the following results:

An imperial gallon of water from lias cutting at Dunball contains—

Organic matter	·96
Sulphate of lime	104·77
Carbonate of lime	30·91
Sulphate of magnesia (Epsom salt)	36·60
Sulphate of soda (Glauber salt)	5·93
Sulphate of potash	4·42
Chloride of sodium (common salt)	18·45
	202·02

It will be seen that the water contains an enormous quantity of mineral mater, and in this mineral matter a considerable proportion of Epsom salt, Glauber salt, and other aperient saline substances. It is an extremely hard water, and essentially differs in composition from ordinary hard drinking waters; for in very hard waters we seldom find more than 40 to 50 grains of solid matter in the imperial gallon, or only one fourth of the quantity contained in the lias water. In good drinking water, of average degree of hardness, the amount of mineral matters varies from 20 to 30 grains in the gallon, and soft waters contain only from 5 to 10 grains in the gallon.

During the dry and hot summer months, cattle which

drink such lias water imbibe with it a very large quantity of mineral and saline substances, which experience teaches disturb the regular functions of the digestive organs, and cause the cattle to scour.

Composition of Spring Water from Ford Farm.

An imperial gallon was found to contain—

Organic matter	·56
Sulphate of lime	109·87
Carbonate of lime	26·55
Sulphate of magnesia	25·80
Chloride of sodium	6·65
Sulphate of potash and soda . . .	6·17
	175·60 grains.

On comparing the composition of this water with that of the Dunball Spring, a general similarity will be noticed. Both springs contain an abnormally large quantity of mineral and saline constituents which cannot fail seriously to affect the health of cattle that drink them. The spring at Ford Farm is not quite so rich in mineral matters as that from the Dunball cutting, but it nevertheless contains a larger proportion of such matters than many waters which, rising in the lias clays, are well known to possess aperient properties. The fact, therefore, that certain waters in the lias formation scour cattle, finds a full and satisfactory explanation in the peculiar composition of the two preceding springs.

The saline mineral substances in these waters, of course, exist in the beds from which the springs rise, or else they would not be found in the water. The blue lias clay, therefore, must be regarded as the primary source from which the scouring properties of the water arise. In this sense it is, after all, the land which causes the mischief. The large proportion of sulphates in the springs of the lias clay is worthy of notice, for it explains the peculiar and disagreeable smell which at times characterises these waters. This smell is due to sulphuretted hydrogen—a gas which is generated when sulphates are brought into contact with organic matters, free access of air being excluded at the same time.

It has been asserted that the coldness of certain waters may be the reason why cattle who drink them scour. But this is not the case; the temperature, as such, has nothing whatever to do with the scouring properties of drinking water. It is perfectly true, however, that the hard lias springs are invariably cold in summer in comparison with rain, ditch, or peat water. In winter, on the contrary, they are warmer than surface springs. This shows that the lias springs, which often issue from clay beds of considerable

depth (unlike rain or ditch water), are not affected by the temperature of the atmosphere. The former, therefore, have a uniform temperature throughout the year, although they appear cold in summer and warm in winter; whilst the temperature of the latter varies with the seasons, in consequence of which they really are warm in summer and cold in winter. Water which rises in the lias-clay, and is invariably cold in summer, having had to pass through beds of clay of considerable depth in its passage, becomes charged with abundance of saline mineral constituents. To these constituents alone, and not to the coldness, the scouring properties of such waters belong.

Soft springs do not scour, for the simple reason that they are always poor in those saline mineral matters which confer medicinal properties upon the hard lias waters. If the contrary be maintained, and no substantial proof be given that the water which is supposed to scour is really soft, I can only say that, in the course of my practice as an analytical chemist, I have frequently had waters submitted to me which were described as soft, and on analysis were found to be quite the reverse.

The water from peat land is always soft. It is supposed to contain tannin, or a similar astringent principle, in virtue of which it becomes a remedy when given to cattle affected by scouring. I do not question that the black ditch water from peat lands stays scouring; this, however, is not owing to any astringent principle which it is supposed to contain, but simply because, in comparison with spring water in scouring districts, it is remarkably poor in saline constituents. If hard water is withheld, one of the causes which in some—perhaps not a few cases—produce the evil is removed, and cattle soon recover when they are supplied with peat water. Tannin occurs in fresh vegetable substances, but as it is a compound which is decomposed with extreme facility, it cannot possibly exist in peat. Direct experiments, moreover, which I have made, proved the absence of tannin or similar astringent principles in peat, and showed to me that the dark-brown colour of peat water is due to certain combinations of ulmic and humic acid in which peat abounds.

From the preceding remarks it may be gathered that one positive cause which produces scouring in cattle is the abundance of mineral and saline matters in certain springs of the lias formation. A still more complete insight into the nature of the mysterious complaint is gained by my investigations on the character of the herbage of scouring pastures.

(*To be continued.*)

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Annales de Médecine Vétérinaires, Bruxelles, March, 1862.

PRACTICAL OBSERVATIONS ON SPASM OF THE ŒSOPHAGUS OF THE HORSE, AND ON THE TRANSMISSION OF *ECZEMA EPIZOOTICA* FROM THE OX TO THE HUMAN SUBJECT.

By M. Guilmot, Government Veterinary Surgeon, Havelange.

Spasm of the Œsophagus.—While the horse is feeding quietly he is suddenly seized with pain, which he exhibits by pawing, switching the tail, putting himself in a position for staling, and various other signs of uneasiness. The abdomen becomes distended with flatus; but, whatever may be the amount of pain and uneasiness, the animal never attempts to lie down. On a careful examination of the attitude of the animal, it is seen that the head is slightly elevated and brought forward, while the ears are flexed backwards. By a sudden movement from behind forwards, the flanks are drawn up by the contraction of the abdominal muscles, the same as in the act of vomiting, which, however, does not take place, but the animal opens its mouth and utters a peculiar noise, as if suffering great pain. He then becomes quiet for a short time, to begin *de novo*. Deglutition is impossible.

In a case seen by the author a draught which the proprietor had tried to administer had been rejected. On passing the hand over the course of the œsophagus, the author was struck with its rigidity; it was like a cord tightly stretched, and the slightest pressure on any part caused sharp pain, which was followed by the peculiar noise before mentioned and ineffectual efforts to vomit. If we classify under the name of spasm all involuntary contractions of the muscles which are characterised by rigidity and complete immobility, it becomes evident that this was a case of spasm of the œsophagus. The dysphagia which accompanied this singular affection is only, the author thinks, a phenomenon connected with the principal lesion, which is essentially nervous. In two other cases observed by the author the animals had never been ill, had had no sort of colic, and both were attacked suddenly while feeding. The information obtained by the most careful observation, and examina-

tion of the patients, failed to explain the appearance of a state of things which can only be attributed to a momentary enervation of the stomach or the œsophagus, or perhaps of both, at the same time. The distension of the abdomen, the restlessness, &c., are to be attributed to general sympathy with the affected organ. According to the symptoms, the treatment must be localized to the parts affected, and ought to consist of a powerful anæsthetic. The author gave preference to chloroform, combined with olive oil, in the proportion of ten grammes to the ounce; six hours after the application of this embrocation the spasm had disappeared, and the animal was in its usual state of health.

Eczema Epizootica.—This aphthous disease is so well known that it would be useless to describe it. I will, therefore, says M. Guilmot, confine myself to two cases in which it has been transmitted to the human subject. These cases are, however, not rare, as the history of epizootics records several. Sagas relates that during the prevalence of eczema in Moravia, in 1764, all the inmates of a convent contracted the malady from having drunk the milk of the affected cows. During the epizootic of 1827, in Bohemia, several persons were attacked by febrile symptoms, which terminated in an eruption in the mouth and feet. In 1834, Professor Hertwig and two physicians of Berlin contracted the malady through drinking the milk of diseased cows. Hertwig had vesicles on his hands. In November, 1831, the author observed two similar cases; the first was that of a little girl, two years old, who contracted the disease after having drunk some raw milk from a diseased cow. The mouth only was affected in this case. The second was a servant, twenty-seven years old, belonging to the same farm, who caught the disease from milking a diseased cow, she having abrasion of the skin of her hands, with which the fluid of the vesicles had come in contact. Not only the hands, but the mouth also, became affected in this case. In both these cases the appearance of the vesicles was preceded by febrile symptoms, heaviness in the head, and loss of appetite. The malady lasted six days. If the use of raw milk is capable of transmitting the disease, will it also when boiled, or mixed with tea or coffee? Though the author advises to abstain from using the milk of the affected cows generally, still he knows many persons who have used it boiled and in their coffee with impunity; but this does not hold good in other animals, as some pigs contracted the disease from eating food with the boiled milk of diseased cows. There could not have been any other cause in this last case, as the pigs had been shut up during the

whole time the malady lasted amongst the cows of the same farm. The virulence of the milk being established, ought it to be given to such calves as are yet free from the disease? If aphthous stomatitis, as the author calls it, is transmissible to individuals of *different* species, it must possess in a higher degree the fatal privilege of communicating itself to animals of the *same* species. It is evident that the disease is inoculable in two ways—1, by the serum of the vesicles; and, 2, by the milk of the infected subject. On the other hand, it is an admitted fact, that in all contagious affections an identical disease to the one from which the virus emanates is always produced, with this difference, that the malady is always more benign, and, consequently, easier to cure.

Treatment.—Though the malady was not severe, it was necessary, however, to adopt some means to shorten its duration. To effect this, a solution of the chlorate of potass was prescribed, as a gargle, three or four times a day.

AMPUTATION OF A HERNIATED UTERUS IN A BITCH.

By Jos. Macorps, Huy, January, 1862.

M. Macorps was consulted respecting a bitch of the pointer breed, which had a tumour in the left flank, opposite to the last teat but one on the same side. It had made its appearance about six weeks previously, and had gradually increased in size; there was neither heat nor pain, but the animal seemed greatly inconvenienced in its movements. The author considered the tumour to be of a fibrous or of a scirrhous nature, very common in dogs. "I set myself," the author says, "without hesitation, to work to extirpate it. A large incision in the skin laid bare a whitish, oblong body, uneven and wrinkled in its longitudinal aspect. I at once discovered the mistake made in my somewhat hasty diagnosis. I found that I had to deal with a herniated uterus. I could feel several fœtuses in it, which must have been developed after the hernia had taken place. It is probable that the fecundated ova had been deposited in the herniated part soon after copulation, or else that the hernia occurred immediately after coition. It was impossible to attempt the reduction of the organ; true, the opening might have been enlarged, but this was not easy, and the hernia

might recur and become complicated. I therefore decided on amputation, and to accomplish this the uterus was drawn out of the opening on a level with its neck, where a ligature was applied, after which it was cut off about two fingers below the ligature. The external opening was closed by suture. The after treatment consisted in keeping the bitch perfectly quiet and on a low diet. A few injections were used. Eighteen days after the operation the owner commenced the shooting season with her. She has remained in perfect health ever since, and done her work with the same vigour as before.

Journal des Vétérinaires du Midi, February, 1861.

ACCIDENTAL PUNCTURES OF THE FEET BY LOOSE NAILS ON ROADS.

By M. Laux, Veterinary Surgeon, Cruzy.

The accidents to the feet of our domestic animals, and more particularly to the solipedes, are at times very serious. These accidents are most frequently produced by causes inseparable from the domestic state of these animals. The gravity of the lesions depends less on their extent than on the causes by which they are produced and of the parts affected. All wounds in the vicinity of the articulations, and above all those in which the capsular ligaments or the synovial membranes are affected, are always the most serious. A fine young mule was totally laid up for several months from a simple puncture made by the scissors in trimming his heels. The wound was a little above the fetlock, from six to eight millimètres in depth; and ultimately caused considerable swelling of the leg, which was only removed by firing. The difficulties which present themselves under certain circumstances in the treatment of these cases, particularly when they have been neglected at the outset, as well as the care and tedious attention required for the perfection of the cure, will often make the practitioner hesitate to undertake the treatment, and the owner to incur the expense. The following case is an instance. On the 26th of December a mule was brought to me; she was about twelve years old, well formed, and in tolerable good condition. She had been lame for three months, from a nail she had picked up in the near fore foot. On examination of the foot, it was found to

be much larger than the other; the animal could bear no weight on it. It was also more concave and wider than the corresponding foot; it yielded on pressure being made on the sole, thus denoting the commencement of disorganization of the parts underneath. A wound, extending from the middle of the sole to the heel, occupied the place of the frog. The softened, disorganized sole had been the seat of an extensive wound recently cicatrized. In the middle of it, at the point of the frog, there was an opening or fistula, which extended into the articulation of the foot, where it formed a sort of cavity, into which two other sinuses also led. In consequence of the nature of the lesions, an operation was decided upon, which was performed on the following day. The animal being cast, the whole of the sole and the adjacent tissues were removed, thereby laying bare the under surface of the articulation of the foot. This ablation laid also bare—1st, the above-mentioned fistula and the cavity, which, being well laid open, gave issue to a greenish-coloured serum mixed with particles of cartilage and bone—the production of the lateral cartilages and the caries of the navicular bone; 2nd, another fistula following the course of the perforator tendon, and forming an opening at the back of the heel; 3rdly, a fistula starting from the same point as the two former, and taking its course to the outside of the foot, passing through the lateral cartilage on the same side, and terminating by an opening at the coronet. The two first of these fistulæ were laid open throughout the whole of their extent, and the diseased parts of the bone were removed. This first part of the operation was terminated by the application of the actual cautery to the diseased parts. In all affections of the feet causing serious lesions actual cauterization is indispensable, not only as a supplement to the knife, but as a means of restoring healthy action to the tissues. After this the lateral cartilage was removed, the *modus operandi* of which it would be superfluous to describe. The large wounds produced by these operations were dressed with pledgets often dipped in spirits of wine, weakened with water and properly fixed by means of a long bandage, after which the patient was conducted back to the stable, and left to the care of the proprietor, with proper instruction as to diet, &c. On the 8th of January there was great improvement; the mule stood up for a longer time, and was able to bear some weight on the diseased foot; the wound had a healthy appearance, and the pus was abundant and healthy. The cauterized parts were dressed with ointment, and the rest with pledgets of dry tow; the diet was ordered

to be more liberal. On the 18th the wound was much smaller; the articulation, the dressing from which had not been removed at the previous visit, was now closed; the patient was able to bear the whole weight on the foot while standing, but much lameness remained when made to move. On the 28th cicatrization was progressing favorably; dressing as before, but less of the ointment, as the state of the parts render it unnecessary. About the middle of February this mule was put to work, which she continued to do for ten months, when, from an accident, she broke her back, and was obliged to be killed. This case shows the expediency—1st, of removing by the knife the whole of the diseased parts, however extensive, or else destroying them by the actual cautery; 2ndly, to avoid frequent dressings, so as not to retard the healing process by the exposure of the wound.

Clinique Vétérinaire, Paris, April, 1862.

QUESTION OF THE CONTAGIOUSNESS OF SPLENIC APOPLEXY BY VOLATILE VIRUS.

This is a letter addressed to the editor of the *Union Agricole* by M. Darreau, veterinary surgeon, at Courtalain, in reference to one published in the *Union Agricole* by M. Garreau, relating to the sanitary police; into the merits of which, however, it is not necessary to enter. According to the author, two principal causes produce the malady, called by the French *sang de rate* (splenic apoplexy). Amongst the first he places those influences, more or less unknown, which constitute the initial cause; in the second, contagion by the virus, fixed or immediate. Sequestration is ineffective in the first, and can only benefit in the second. Even the general slaughter of the animals cannot destroy the primary cause, and the healthy flock brought to the farm will be attacked in the same manner as the others. In the heat of the summer the new flock will be decimated equally with that which has been slaughtered. To render this discussion more clear, M. U. Leblanc gives the letter from the *Universe Agricole*, of the 12th of December, 1861, which is as follows: —"M. Rogers, agriculturist, in the commune of Lutz, seeing his flock attacked by splenic apoplexy, was indebted to M. Joseph, farmer, at Chamblais, for obligingly allowing him to take his animals to the farm of the

latter at the Tribandière (Loir et Cher). The neighbourhood took alarm at this, the more so as the shepherds left the carcasses of the sheep lying about. M. Rogers had to appear before the tribunal of the correctional police, and was condemned to pay a fine, and to take his flock back to Tusne. Everything had subsided, when the sheep of M. Joseph were attacked by the same fatal malady at Chamblais, and, as proprietor of the land, he sent his affected flock to Droué, without the slightest regard to the well-grounded complaints of the farmers. This caused a fresh complaint to be addressed to the procureur of Vendôme by M. Clousier, who, meanwhile, lost a cow, the autopsy of which proved that she had been affected with splenic apoplexy. Having received an order from the Procureur Impérial to make a circumstantial report on these facts, impressed by the importance of the object, I immediately set about fulfilling it. I found at the Tribandière a flock of sheep, of about 230 head. The shepherd informed me that twelve had died before they quitted Chamblais, and nine had died since their arrival, from the 31st of August to the 16th of September, the day of my visit. The autopsy of two carcasses revealed an absolute identity in the lesions with those found in the cow of M. Clousier; but instead of declaring that the flock had brought the infection, and was the cause of the death of the cow, I contented myself by expressing my fears that this might have been the case. This was an excess of prudence, for there was enough for a contagionist of twenty years' standing to pronounce upon with certainty. The *débris* of the dead sheep lay in every direction in the field, as stated in the police report, contiguous to the pastures of M. Clousier. There had also been direct communication between the two flocks, and, moreover, I had in my favour the opinion of many practitioners, of great reputation, on the subject of contagion. Amongst others, that of my late father, who was in favour of this mode of contagion, and also of my worthy colleague of Châteauneuf.

"M. Moisant and myself were one day called to a consultation at M. Martin's, farmer, at Arrou, whose farm was at the time laid waste by splenic apoplexy amongst his sheep and neat cattle, and also the carbon amongst his horses. My colleague did not hesitate to declare that the contagion arose from the emanations of the skins of some sheep which were hung up to dry in a shed. He recommended that these should be buried. M. Martin had confidence in this consultation and acted accordingly, and is now zealous in its favour, in spite of the new views of his advocate. On

the other hand, I am persuaded that the latter completely ignores the medical constitution of Brou, for had he known it he would have seen that the market of that place was not favorable to his cause. In fact, there is, perhaps, no district in the Beauce more subject to the ravages of carbon and splenic apoplexy than this town and its environs. The dairymen are at times in despair on account of it. I have been informed that of ten carcasses brought to the knackers at Brou, eight have been affected by carbon. Who does not know the enormous losses sustained by M. Dénau du Tuilé, whose farm is close to the gate, and near to the high road? Who is not acquainted with the fact that his unfortunate wife died from a carbonous tumour? Every one agrees that the cattle which are brought to this fair are liable to propagate the contagion of these fatal maladies, viz., splenic apoplexy, variola ovina, glanders, &c. Towards 1844, a flock of sheep, affected with splenic apoplexy, were sent to M. Bertrand's, Commune de la Chapelle-ville-Comtesse (Loir et Cher). A short time after the malady declared itself amongst his cows, and he soon lost a score of them. M. Roger was still more unfortunate; all his cattle were the victims of it—neat cattle, sheep, horses, all fell a sacrifice, and he was ruined through the visitation. As the fields were contiguous, and the sick and healthy grazed close together, was there contagion by the volatile virus? The fact cannot be denied. However, a similar affection had never been known in the country, which is woody and has a loamy subsoil. From the preceding cases we cannot but conclude that the criticism on the tribunal of Vendôme was written without due care.—Darreau, *Vétérinaire.*"

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, held April 2, 1862.

The President, F. R. Silvester, Esq., in the Chair.

Present:—Professor Spooner; Messrs. Cartledge, Lawson, Wilkinson, Withers, Gamgee, Broad, Ernes, Harpley, Robinson, Field, Jex, Moon, Braby, and the Secretary.

The minutes of the last meeting having been read and signed,

It was proposed by *Mr. Ernes*, and seconded by *Mr. Wilkinson:*

"That the letter received from the Secretary of State, in answer to the memorial address to the Queen, be entered upon the minutes." Carried.

It was moved by *Professor Spooner*, and seconded by *Mr. Cartledge:*

"That a suitable testimonial be presented to Mr. E. Braby, for his kind and efficient services as Secretary *pro. tem.*, and that the sum of £50 from the funds of the College be applied for that purpose, accompanied with a vote of thanks from the Council."

The quarterly balance-sheet was read. After paying the current expenses, it showed a balance in hand of £391 6*s*.

The election of a member of the Board of Examiners was then proceeded with.

On the ballot being taken, Mr. Field was declared unanimously elected.

The election of two Auditors was then proceeded with.

Mr. Cartledge proposed Mr. Richard Skelton, junr., of Leyton, and *Mr. T. D. Broad* proposed Mr. J. C. Broad, of Paddington.

They were unanimously elected.

Messrs. Wilkinson, Ernes, Braby, and the Secretary, were appointed a committee to prepare the annual report.

It was proposed by *Professor Spooner*, and seconded by *Mr. Braby:*

"That due notice be given, by public advertisement, of the days of examination to qualified candidates for the diploma of the Royal College of Veterinary Surgeons." Carried.

The resolutions submitted by the Scotch Board of Examiners were carefully considered, when it was proposed by *Mr. Withers*, and seconded by *Mr. Broad:*

"That a courteous and conciliatory letter be addressed to the section of the Board of Examiners for Scotland, explaining the circumstances under under which those suggestions were made; and also that some of their propositions were contrary to the bye-laws."

Cheques were ordered to be drawn for the current expenses.

By order of the Council.

W. H. Coates,
Secretary.

SPECIAL MEETING, HELD APRIL 16, 1862.

The President, F. R. SILVESTER, Esq., in the Chair.

PRESENT:—Messrs. Wilkinson, Ernes, Harpley, Legrew, Braby, Moon, Withers, and the Secretary.

The minutes of the preceding meeting having been read,

The audited balance-sheet and the annual abstract of the proceedings of the Council, as prepared by the Committee, having been read,

It was moved by *Mr. Moon*, and seconded by *Mr. Legrew*:

"That the annual report and balance-sheet be received and adopted." Carried.

Letters were read from Dr. Struthers and the Cour tof Examiners in Scotland, tendering their resignation *conditionally*, *viz.*, that if the suggestions submitted in May last were not acceded to, they should be reluctantly compelled to resign their office.

After considerable discussion,

It was moved by *Mr. Ernes*, and seconded by *Mr. Braby*:

"That all the bye-laws bearing on the suggestions made by the Scotch Court of Examiners in May, 1861, and submitted to the Council, be suspended from this date." Not carried.

It was deemed advisable that another special meeting be convened as early as possible, and that a letter be immediately sent to the Secretary of the Scotch Board of Examiners to the effect,

That the Council regret to hear of the intended resignation of the gentlemen named in his letter as Examiners, and that they further regret that, from the small number of members of the Council present this evening, they did not think so important a question could be decided.

It was also resolved that a special meeting be called, so that the subject might be further discussed.

By order of the Council.

W. H. COATES,
Secretary.

SPECIAL MEETING OF THE COUNCIL, HELD APRIL 22, 1862.

The President, F. R. SILVESTER, Esq., in the Chair.

PRESENT:—Messrs. Wilkinson, Hunt, Jex, Gamgee, Braby, Varnell, Harpley, Withers, and the Secretary.

The minutes of the last meeting were read, also the following letter from Dr. Struthers:

3, Park Place, Edinburgh;
April 18*th*, 1862.

Sir,—On the part of the Edinburgh Examiners, I have much pleasure in accepting your letter of the 16th instant, received this day, as a satisfactory reply to our letter of the 9th instant. I understand that the Council meeting which you mention as held on the 16th instant constitutes the first of the Council meetings which are necessary under the charter and bye-laws, to enable the resolutions of the Scotch Board of May 10th, 1861, to be passed into bye-laws, should the Council see fit to do so.

I shall lay this correspondence before the first meeting of the Scotch Board of Examiners, and any communication which that Board may have to make to the Council of the Royal College will be duly forwarded by me or by my successor, as it is not my intention to continue to act as Secretary to the Board.

I am, sir,
Your obedient servant,
John Struthers.

W. H. Coates, Esq., Secretary,
Royal College of Veterinary Surgeons.

It was moved by *Mr. Wilkinson*, and seconded by *Mr. Hunt*:

"That the 2nd, 4th, 5th, and 6th propositions made through Dr. Struthers, on the part of the Scotch section of the Board of Examiners, be acceded to." Carried.

"That No. 1 proposition be duly considered when the notice affecting it shall have been suspended according to law for three months.

"And that No. 3, 'That the meetings of the Scotch Board of Examiners shall be summoned by the Secretary to that Board,' be also acceded to; with this addendum, viz., 'after consultation with the President.'" Carried.

It was next moved by *Mr. Gamgee*, seconded by *Mr. Wilkinson*, and carried unanimously:

"That a copy of the above resolutions be forwarded to Dr. Struthers, with an expression of hope from the Council that the veterinary profession may continue to have the advantage of the valued co-operation of the medical members of the Scotch section of the Board of Examiners of the Royal College of Veterinary Surgeons, with Dr. Struthers as its Secretary."

To this a very satisfactory reply has been received from Dr. Struthers.

By order of the Council.
W. H. Coates, *Secretary*.

Veterinary Jurisprudence.

CAUTION TO BUTCHERS, DROVERS, ETC.

At the petty sessions at the Town Hall, Brentford, before Mr. F. H. N. Glossop and a full bench of magistrates, Henry Hetherington, a butcher, William Widdick, a labourer, and Richard Weight, a lad in Hetherington's employ, were charged by the Royal Society for the Prevention of Cruelty to Animals, the former with having caused and procured a bull to be cruelly illtreated and tortured, and the latter two with having illtreated and tortured the same animal at Ealing, on the 10th ult.

Mr. William Love, instructed by the secretary of the Royal Society, attended to conduct the prosecution.

The evidence, which was lengthy, was fully explained in Mr. Love's opening, from which it appeared that the bull originally belonged to Baron Rothschild, and was kept at the baron's estate at Gunnersbury, being a very docile animal. A serious accident happening to one of its hind legs, and all the care bestowed on the case being of no avail, the baron humanely ordered that the animal should be sold to be slaughtered without delay. The defendant Hetherington became the purchaser, stipulating to send a conveyance for it to take it to Kingston market on the following day, but instead of doing so resolved, if the animal could be made to do so, that it should travel the distance on foot, notwithstanding that it was unable to put its injured limb to the ground. Widdick, who was employed to drive the bull, procured a long pole with an iron hook at the end of it, and fastened this to a ring which was passed through the animal's nostril, and so, by dint of tugging and wrenching at its nostril, assisted by the defendant Weight, who beat it in a most brutal manner about the injured leg, the poor animal was got as far as Kew Bridge, where it came to a standstill. At that time some gentlemen coming up and seeing the state the animal was in, interfered, and caused it to be slaughtered and put out of its agony.

The witnesses described the animal's sufferings to have been intense, and that it took nearly five hours to get it to a shed 150 yards off.

Mr. Love urged that the defendant Witherington's motive could only have been to save himself the expense of a conveyance, thereby defeating the humane intentions of the baron. He therefore felt bound to press for a severe punishment.

The Chairman said the bench could come to no other conclusion than that cruelty of the grossest kind had been inflicted upon the poor animal. He should fine the defendant Witherington £2 and costs, or a month's imprisonment, Widdick, £1 and costs, or fourteen days' imprisonment, and Weight would be cautioned and discharged. The Chairman also said the baron's herdsman who permitted the bull to be removed in such a state, disregarding thereby his master's orders, deserved censure.

The Lord Chief Baron Pollock occupied a seat on the bench, and the case created considerable interest.

ARMY APPOINTMENTS.

War Office, Pall Mall, *April* 22, 1862.

Veterinary Department.—G. Blake, Gent., to be Acting Veterinary Surgeon,

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OBITUARY.

Died suddenly, at New York, U.S., on March 16th, Robert Pooley, M.R.C.V.S., late of Heacham, Norfolk.

THE

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Communications and Cases.

MR. HARRISON'S CASES OF "POISONING OF CATTLE AND A PONY BY ARSENIC."

Letter from Professor Tuson, of the Royal Veterinary College.

Dear Sirs,—In the May number of the *Veterinarian* there appears an article, entitled "Poisoning of Cattle and a Pony by Arsenic," by Mr. John Harrison, of Brough, to which is appended an analysis made by that gentleman, with the assistance of his friend, Mr. Walton. It is with reference to this analysis that I beg to be permitted to make a few remarks.

In the article referred to, it is stated—"Premising that the parts contained some mineral poison soluble in boiling water, we placed a portion of the liver in a tumbler, with some clear rain water sufficient to cover it. After subjecting this to boiling heat on a sand-bath for about half an hour, the suspected fluid was twice filtered through bibulous paper, and then portions of it were subjected to the following test:

"I. *Ammonio-sulphate of copper*, which gave a grass-green precipitate—Scheele's green.

"II. *Ammonio-nitrate of silver*, a flocculent, yellow, precipitate, soluble in excess of ammonia."

Now before proceeding to detail the other tests which were employed, I may observe—

1stly. That, when absorbed by the liver, arsenic is rendered insoluble in water by combining with albumenoid bodies, and that chemists and toxicologists are consequently in the habit of dissolving out absorbed arsenic from the tissue of an organ by means of hydrochloric acid or some other appropriate solvent.

2ndly. That even supposing Messrs. Harrison and Walton succeeded in dissolving out arsenic from the liver in the way they describe, the solution obtained would be so largely contaminated with foreign substances as to render it unfit for the application of the ammonio-sulphate of copper and the ammonio-nitrate of silver tests. *These tests should be applied to a pure aqueous solution of arsenious acid only.*

Mr. Harrison enumerates two other tests which are quite new to me as indications of the presence of arsenic, although I have been engaged in analytical chemistry for the last fifteen years. These tests, which were applied to the aqueous solution of the liver, are as follows:

"3rdly. *Chloride of calcium,* a white precipitate.

"4thly. *Caustic potash,* with excess of ammonia, being added to a portion, it was treated with a solution of sulphate of copper. On the application of heat, the red suboxide of copper was deposited at the bottom of the tube, indicative of arsenious acid, but valuable only so far as corroborating the previous tests."

Chloride of calcium will not give any precipitate with an aqueous solution of arsenious acid.

Although a solution of arsenious acid in water will precipitate red suboxide of copper when boiled with a mixture of sulphate of copper, potash, and ammonia, this reaction is never made use of by chemists, even as a corroborative test for arsenic, as it is liable to many sources of error.

The only analytical evidence upon which any reliance can be placed is to be found in the concluding paragraph where Reinsch's test for arsenic is described. But even there the author does not state whether the sublimate which he obtained by heating in a tube—the copper "coated with a dark, steel-grey crust"—was crystalline or amorphous. The sublimate of arsenious acid invariably assumes the form of octohedral crystals, which is highly characteristic of that substance. In order to obtain corroborative testimony relative to the sublimate being really arsenious acid, Mr. Harrison says that he dissolved it in "water *acidulated with a drop or two of hydrochloric acid.* This was now treated with ammonio-sulphate of copper, when we had the green precipitate, as before stated, with the neutral solution." With reference to this last test, I need only remark that no green precipitate (Scheele's green) could possibly have developed itself while the solution to which the ammonio-sulphate of copper was added contained free hydrochloric acid.

I cannot conclude without expressing my great regret that

the incorrect manner in which Messrs. Harrison and Walton conducted the chemical analysis, described by the former gentleman in his paper, should have been the cause of my troubling you with these remarks. I felt, however, that, as Professor of Chemistry to the English Veterinary College, I should be omitting a duty were I to remain silent upon so important a matter, and one in which the liberty of the subject may possibly be involved.

I am, &c.

To the Editors of 'The Veterinarian.'

[We have received a communication from Mr. Harrison, pointing out two errors in the paper above alluded to. They simply refer, however, to dates, and are as follows:

Page 265, seventh line from the bottom, *for* 9th of May, *read* 9th of January.

Page 266, ninth line, *for* 16th of May, *read* 16th of January.]

ON SOME OF THE DISEASES OF THE STOMACH AND INTESTINES OF THE HORSE AND OTHER ANIMALS.

By Professor Brown, M.R.C.V.S.,
Royal Agricultural College, Cirencester.

Among intestinal affections we occasionally meet with a species of spasmodic cholic, presenting the peculiar features of obstinacy in progress, and uniform fatality.

The malady will be best described by reference to certain cases:

First among the instances we have had to treat, we remember a grey Arab about eight years old. This animal, from his fierceness, was kept in his stall for six weeks, so tied that he was compelled to stand during the whole of the time. On attempting to remove him to another establishment, the halter ropes were of course loosened, when immediately the animal fell, and gave evidence of violent abdominal pain by rolling and kicking, seemingly incapable of rising. A veterinary surgeon of eminence in London saw the case, and directed treatment, which we had an opportunity of observing throughout. The symptoms commenced at 9 o'clock in the forenoon, and, without amelioration, continued

until 5 o'clock the following morning, when death took place. The indications were those of spasm without intermission; from the time the animal fell, until he expired, he did not cease to express by violent struggles the intensity of his pain; the pulse was strong, full, and accelerated, as would inevitably be the case when extreme excitement was present, and there was an evident inability to stand, or an absolute disinclination to do so. The treatment included bleeding, narcotics, as opium, tobacco enemata, also mild laxatives and constant fomentations to the abdomen, followed by mustard poultices, all without the slightest effect upon the pain.

After death a rigid examination of the internal organs was instituted in the presence of three professional men, who were equally impressed with the unsatisfactory nature of the evidence obtained. No indication of inflammation or any of its products was seen; the membrane of the stomach was slightly irritated, but not more than might be expected from the exhibition of medicaments for any length of time; the colon was filled with ingesta presenting nothing peculiar; the small intestines and stomach contained only fluid, the animal not having taken any food for at least twenty hours before his death.

That the fatal result arose from the prostration consequent upon unceasing pain, was evident enough, but the difficulty still remained to account for its continuance. Spasm of the muscular structure of the intestines is usually productive of much suffering, but the condition is an evanescent one, and is commonly modified by very simple treatment, or proceeds to terminate in strangulation or intussusception. In the case before us we had indications, during life, of spasm of the most violent character, continuing without being in the smallest degree alleviated by the most energetic treatment, and after death leaving nothing to explain the obstinate nature of the disease.

Alone, the above instance would hardly deserve comment, happening as it did many years ago the impressions left by it may have in some degree faded; some of the evidence may have escaped observation; but since the occurrence of this case, numerous others have presented themselves identical in every characteristic particular. Sometimes an ordinary attack of cholic has preceded the more violent symptoms; the patient has alternately lain down and again risen several times before resuming the recumbent posture permanently. Once, and that lately, we had a singular instance of the disease shorn of its violent character, the pain being equally continuous but less acute, allowing the patient to stand in

comparative tranquillity, and only destroying life after four days' continuance, meanwhile, as usual, being quite unimpressed by any remedial measures.

During the treatment of numerous cases it will be surmised that various means have been employed in the endeavour to lessen the pain, which seemed to be the most serious element in the disease; chloroform promised, from its potency as an anæsthetic, to effect this at least, but instead its inhalation only increased the excitement; given internally, and in the form of enema, it was equally powerless for good, although we avoided the increased excitement which attended the inhalation of the vapour. Aconite, continued perseveringly, proved nearly inert, and ingenuity in vain sought an agent which might successfully oppose itself to the incessant suffering which seemed destined to continue with the life of the patient. In each succeeding case arose a new hope of finding something to account for the symptoms —a calculus, strangulation of the intestine, poison, some changes which should indicate the intensest of inflammation— but in no instance has anything been discovered that would lead the morbid anatomist to surmise that death had been caused through the medium of extreme internal agony. During a chance conversation with a physician upon the subject, it was suggested that spinal irritation could alone account for the continuous pain; the idea was sanctioned by the circumstance of the animal then spoken of having been in foal, and within a month of the time of parturition when fatally attacked. In such a case there would naturally be an exaltation of the sensibility of the nerves originating in the posterior part of the spinal column, which would actively transmit a morbid impression from the intestines to the spinal centres, and by reflex action back to the intestines again in a perpetually alternating current; so that a common cause of intestinal spasm, such as a draught of cold water, might thus originate a morbid condition that the excited reflex functions would render permanent. Fortunately for the interests of science, an opportunity of testing the value of this theory soon occurred. Another animal in similar condition, within a month of the time of foaling, evidenced an attack by symptoms of continuous uneasiness. No time was given for the disease to be fully developed, the object being rather to save the animal than to establish the truth of a surmise; therefore it is not intended to advance a solitary and even doubtful case as important evidence; nevertheless, it was clear that an irritation existed in the intestines; previous experience had shown the obstinate nature

of similar irritations, and a course of treatment was at once decided upon—to divert the impression from the spinal nerves by active counter-irritation, and to allay the irritation in the nerves of intestines by sedatives and bland diet. The application of ammonia to the spine fulfilled the first indication; the second necessitated abstinence from bran, oats, or hay, and the allowance only of linseed tea. Small doses of aconite, every three or four hours, with fomentations and mustard poultices to the abdomen, completed the therapeutic treatment, which was rapidly successful; the patient was scrupulously fed upon a non-irritating diet for some days, enjoying perfect rest, and has since foaled safely.

In every instance of an animal remaining down for some hours consecutively, both the bladder and rectum become inconveniently distended and require mechanical relief; indeed, the practitioner's first care is to remove all danger on this score before he proceeds to get the patient from his present posture. It is rather a curious fact that the animal struggling on the ground is less likely by far to be relieved by treatment than one who remains standing, or who occasionally rises. When even no disease of any kind is present, the mechanical inability to rise in consequence of the peculiarity of posture, or the size of the place in which the animal may be, is attended with symptoms of violent abdominal pain. From the alarm which the subject suffers, and the furious and useless efforts he makes to escape, the secretions become deranged, tympanitis is added to nervous excitement, and to these distension of bladder and rectum. A fatal result may be predicated, unless the position be promptly changed; this is not easy, and often requires the aid of pullies, necessitating some delay; immediate danger in the mean time is lessened by the catheter and enema syringe, with the addition of a sedative dose.

The animal being placed upon his feet, commonly is unable to support himself in the standing posture without assistance, and makes uneasy efforts to lie down again; this intention we have usually successfully opposed by smart strokes with a whip or stick, the attendants meanwhile applying friction to the side on which the animal has lain, and which consequently is suffering a temporary paralysis. In a very short time the patient is capable of moving, and should be at once walked in hand for half-an-hour, by the end of which time he will most likely be quite restored; so many apparently serious cases are of this class, that it should always be considered desirable to raise the patient suffering from abdominal pain from the ground; if he has lain there for some

time, and seems unable to rise without assistance, it will sometimes be impossible to prevent his again lying down, but we shall at least have ascertained that he is not what the groom calls "cast," that is, so lying in consequence of something in his position preventing him from rising, this condition being certainly fatal if not rectified in time.

The disease of which we have been speaking being so usually associated with a recumbent position, has led to the adoption of the means at hand for lifting the patient up and supporting him subsequently, but without avail; it soon becomes evident that extreme exhaustion from pain is the cause of the position being chosen.

Doubtless this peculiar form of intestinal disease is familiar to many of the experienced members of the profession; and, taking into account its obscurity and fatality, we feel we are not unreasonable in expressing a hope that the readers of the *Veterinarian* may be favoured by the publication of numerous like instances, which we feel confident are scattered through many a well-filled case-book.

THE SUPPLY OF PATIENTS TO VETERINARY INFIRMARIES.

By the Same.

In your leader of the last number of the *Veterinarian* you discuss a question of profound importance to the veterinary student, the agriculturist and, indeed, to the whole community—the impossibility of obtaining a reasonable amount of *practical* knowledge of the various diseases of cattle and sheep without a constant and systematic observation of the sick animals is patent to every one.

However arduous in the pursuit of science, however unflagging may be the energy of instructors, the results cannot be satisfactory, in the absence of efficient hospitals.

Under present circumstances, the student may become a practical and good anatomist, a botanist, physiologist, or chemist, and be also well-instructed in the principles of pathology; but before he can claim the position of a *practical pathologist*, he has to suffer the doubts and fears, and to struggle against the errors of inexperience. Practical information, acquired previous to a scientific education, furnishes a poor substitute for that knowledge which should be acquired in connection with scientific principles under the eye

of the teacher. What does all the so-called practical knowledge apart from science often amount to? How many years' experience are required to render an unthinking and uneducated man, in the matter of therapeutics, and entirely devoid of principles, a cautious, reflecting, and safe practitioner? Let us rather have the student, who has well spent his two or three sessions under the guidance of men who are capable of directing his inquiries, and who have the means to illustrate their teaching, than the man who has spent thirty years of his life in a ceaseless repetition of the *formulæ* handed to him through past generations, and who probably thinks no more of inquiring into the laws of organization, or the action of the medicines he uses, than he does of discussing the merits of the 'Principia.'

The causes that militate against a sufficient supply of patients to veterinary infirmaries are numerous, and apply with various degrees of force to the different animals. Some of these causes are general, others are special or limited.

General objections present themselves on the score of expense and trouble. The experiment of free admission for cattle and sheep has been tried by us as well as others, and has failed. The difficulty of the expense of transit, however, remains; and, as you observe, any benefit obtained from the animal's carcass is lost; and in the instance of milking cows, also, another considerable item may be placed on the wrong side of the account.

Treatment upon the owners' premises is commonly an inexpensive thing. The farmer himself enjoys some excitement in the act of trying a little amateur practice. Beyond all question, men have a taste for playing with medicine, as children delight to sport with fire, and frequently with much the same effect. If the owner lack the taste or the time, there is at hand the *cow-leech*, who for the merest trifle is ready to do his best—worst it may be?—for the patients.

Next may be placed the amusement, or whatever else it may be called, to be derived from frequent visits to the shed or stable of the sick.

To the unversed in these matters, this remark may appear almost ridiculous; but we can assure them that the satisfaction so derived is not small; in fact, we believe, that the owner of a sick animal no more thinks of sending it to a public hospital, than he thinks of going to one himself.

If by chance he be urged to do so, or the case is hopeless or nearly so, or it wearies him, or any direct advantage can be shown to arise from it, the step may be taken; but in our

experience, under ordinary circumstances, the idea is not likely to occur at all to his mind.

Further, a startling objection is found in a widely prevalent belief than animals in hospitals are made the subjects of *experiment*. The word has a sharp sound, and popularly is expressive of untold horrors. No direct charges are brought, but the very uncertainty and vagueness of the idea invest it with additional terrors as to the animal's fate. Not among the ignorant only are these notions current. Reports of the enormities committed by us on various hapless subjects are discussed and find favorable reception in polite circles. Some of these reports are returned by sympathising friends, and until we heard them we had no idea what brutes we really were. We have no intention to insult the common sense of your readers by any serious refutation of these absurdities. Every hospital is open to public inspection at all reasonable hours, and what is done can be seen and, if desired, made public.

Special objections refer to certain cases, and particular animals. They relate to the difficulty and danger of removal in all acute cases of disease, or very extensive injuries. Sheep, we know, are usually consigned to the butcher at once; and cattle also, when the disease seems in any of its stages unlikely to yield to treatment. These several difficulties appears to us surmountable only in two ways:

1st. By exciting sufficient interest among stock owners to induce them to send their sick animals for the benefit of future veterinary surgeons.

2nd. To make it to their own advantage to do so.

This latter plan, we have no doubt, would be most generally successful; and it might be carried out, as everything in England can be, by co-operation. Without entering into premature details, we may mention that in our opinion the formation of one or several companies for the purchase of diseased animals of all kinds would supply the present want; and at the same time we have that faith in the science of medicine which leads us to believe the supporters of the movement would be amply remunerated for their trouble. For any plan that does not include *purchase* of patients we prophecy a failure.

RABIES IN A HORSE.

By R. H. Dyer, M.R.C.V.S., Waterford.

A few weeks since I promised to send you an account of a case of rabies in a horse, but circumstances over which I have had no control have prevented my doing so till now. In the mean time I have been endeavouring to ascertain with certainty when the animal was bitten. No person can or *will* say, however, whether he was bitten or not, and the only evidence to be procured is that several mad dogs have been in the neighbourhood, and that many animals have been bitten, and, further, that in every case the animals so bitten were at once destroyed.

According to the evidence it appears that the horse in question was taken ill on Saturday, February 22nd, on which day the owner applied to me for a colic draught, such as was sent to a neighbour of his a short time before.

I made some inquiries as to the symptoms present, when he replied that the animal was in great pain, and had had no evacuation either from the bladder or bowels. He took with him an ordinary colic draught, which, however, did not afford any relief, for, on the following morning, Sunday, I was requested to see the horse; he being sent to my place of business. When my attention was first directed to him, he was standing side by side with a mare, and I inquired how long he had been blind. The owner answered that he did not know he was blind, but that he had noticed something "odd about him," for he blundered about, and did not seem to know what he was doing. On my approaching him he snapped at me, which led me to inquire if he was in the habit of biting. The man answered in the negative. I said, "He has an appearance akin to that of a mad dog." The saliva was flowing from his mouth at this time. The moment I made use of the term *mad dog* neither the owner nor his servant would approach the animal. I suspected the horse had been bitten, but I could not elicit from them any information to lead me to a correct decision. They merely said that a mad dog had passed through their premises about three weeks before, and it was known that he had bitten several animals in his progress.

The symptoms present were as follows:—The horse was very restless, and snapping at everything within his reach, excepting the mare which was with him. He never attempted, that I am aware of, to injure her. On feeling his pulse I did not detect any marked peculiarity in it, excepting a prolonga-

tion occasionally of its beat. The respiration, however, was very much accelerated, which seemed somewhat strange, considering that the pulse remained unaltered. I made a special remark about this at the time. I examined every part of the animal, but did not detect any evidence of a bite. The prominent symptoms were total blindness, arrestation of the urinary secretion, discharge of large quantities of saliva, unceasing restlessness, and occasional attempts to bite those near him. He also had a most *ferocious* look.

I administered a sedative draught with great difficulty. The act of giving the medicine brought on a severe paroxysm. He became almost frantic. Being much worse, in a couple of hours I attempted to administer another drench, but found it to be impracticable. Every attempt at introducing the horn into his mouth made him furious. He would throw himself upon the ground—not fall down—as if determined to break his neck. He would soon rise again, and stagger about the yard, all the time snapping at the rope by which he was held. At length, finding he was becoming dangerous, I secured his legs when down, and kept him in that position, which made him, if possible, more frantic. At this time the owner, seeing the horse secured, felt more at ease, and approached within a couple of yards of him. He soon consented to my destroying him, which I did by opening the right jugular vein and blowing into it. This took place about 3 p. m., and five hours after I first saw him. For the last three hours, in particular, the animal had been most dangerous to approach or to handle.

The next morning I examined the interior of the body. Nothing seemed amiss except the heart, which was greatly dilated, pale, and soft in texture. The brain was afterwards examined in the presence of a medical friend. We found the membranes very much inflamed, especially at the base of the brain. Although it was evident that the base of the organ had suffered most, we were of opinion that the substance of the brain in general gave indications of disease. I have since been told that many other animals have been bitten by dogs supposed to be mad. From what I can learn, it seems that about three weeks elapse before the bitten animals are seen to suffer. The black mare, whose companion the horse was, has been attacked since, and, I believe, was destroyed. It is almost impossible here to trace things to their source, for the country people will afford no assistance. The desire to stifle all information abounds with them. I fear I have not added much to that which is already known of this disease, but such as that case is it is at your service.

THE DIPPING OF SHEEP IN AUSTRALIA FOR THE PREVENTION OF SCAB.

By J. Annand, Veterinary Student, London.

With an Illustration.

I have much pleasure in communicating to you the following very simple and effective means employed in the western district of Victoria, Australia, for the prevention of *scab in sheep*, a disease which has caused immense losses in that country.

A bath is made which contains one pound of tobacco and one pound of sulphur to every five gallons of water, and into this the animals are plunged. The mixture is always kept as warm as the animals can bear it, avoiding, of course, extremes. Coppers are erected to boil the tobacco, after which the decoction is placed in a large dip or receptacle, and the sulphur is then added. These dips are constructed of various sizes, and sunk in the ground.

The heat of the mixture is kept up by the addition of hot liquor, and partly by the bodies of the sheep themselves. The dips should not be too large, as there is then a greater difficulty in keeping up the temperature of the fluid. If too small, however, there is a danger of the sheep striking on the bottom, when precipitated into the receptacle from the pen above. A good size is that which will hold ten or a dozen sheep comfortably at one time. Its depth should be about five feet. I enclose a sketch of the dip, yards, &c., which will assist your readers in understanding the method of using the bath.

Having filled the dip, the sheep are either thrown in one by one until it is full or they are precipitated from the floor-trap situated above it. Men are placed in the bath, who keep the sheep moving about. Occasionally they push their heads under the water by means of crutches with which they are furnished. The sheep are thoroughly soaked in three or four minutes. The door communicating with "the race" is then lifted up, and the sheep pushed through it into this passage. On the door being again let down the dip is ready for another lot. The sheep find their way from "the run" into the draining yards, which are paved and slightly inclined. The yards being two, the furthest one is first filled and the gate then shut. The lower one is next filled, and when this is done the sheep in the upper yard are allowed to go away, those in the lower one taking their place. By this plan we ensure

Explanation of the Illustration.

Fig. I *shows a side view of the Dip, Yards, &c.*

A. Yards into which the sheep are first brought. The "dipping pen," having a moveable floor, *E*, secured by a bolt, by withdrawing of which the sheep are precipitated into the dip.

C. A "*decoy pen*," into which two or three sheep are placed, to induce the others to go forwards.

F. The dip, containing the mixture.

G. A sliding door, communicating with "the race."

H. Apparatus for raising the door.

I. "The race," leading to the draining yards.

Fig. II *represents the Ground Plan.*

A, A, A. The yards.

B. The "dipping pen."

C. The decoy pen.

F. The dip.

G. Door communicating with "the race."

I. "The race."

J. Lower draining yard.

K. Upper draining yard.

L. A channel to receive the superabundant fluid and carry it back into the dip.

Fig. I

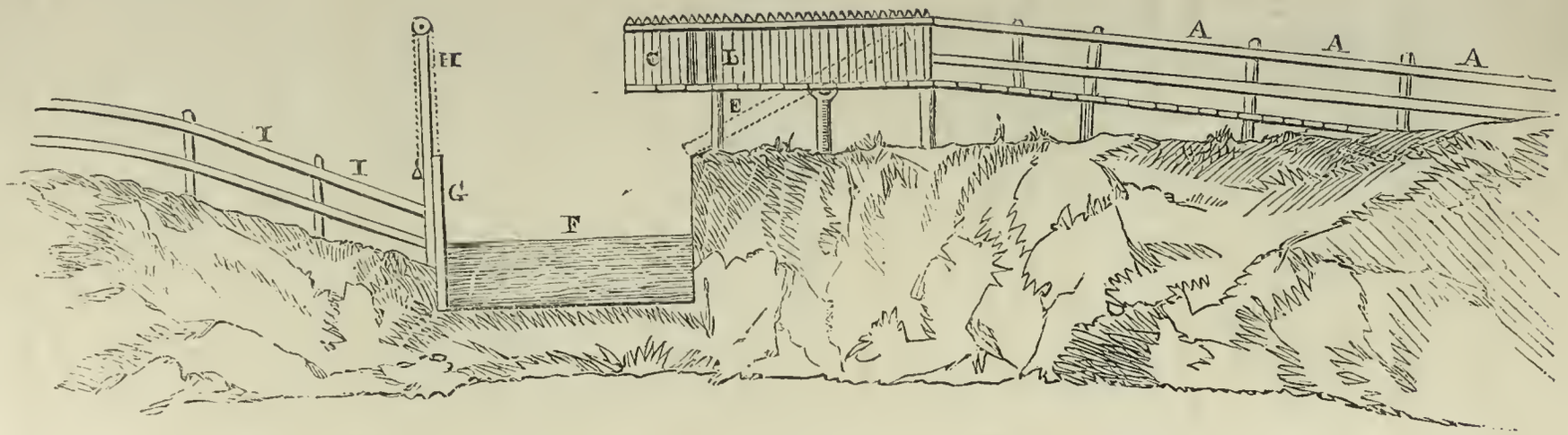
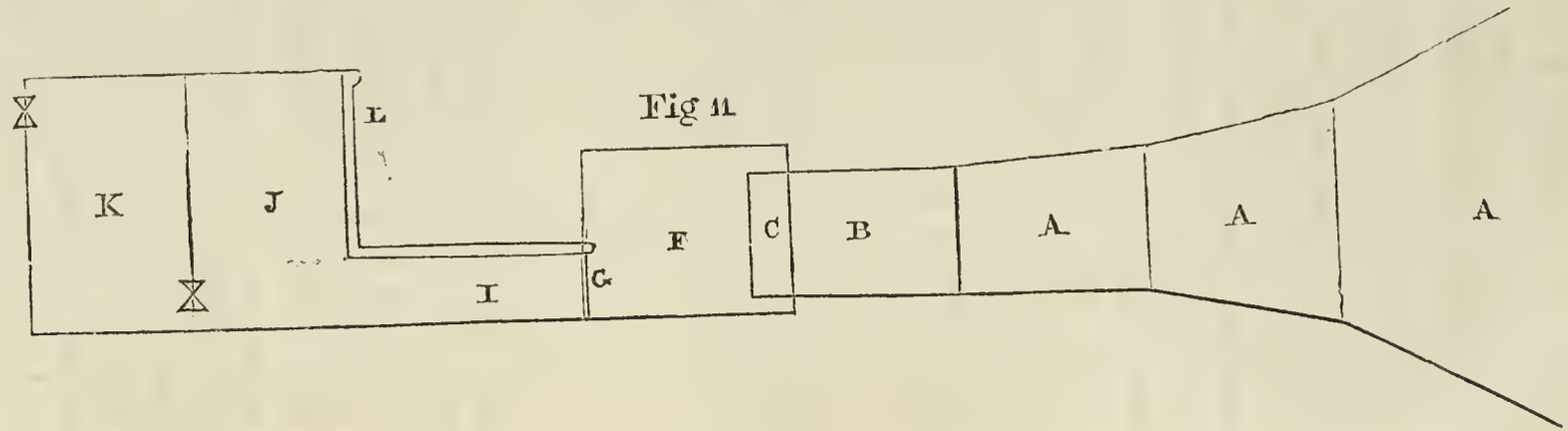


Fig. II



the sheep being thoroughly drained, and also save a good deal of the dipping mixture.

It is necessary to add fresh liquor from time to time, to keep up both the heat and proper strength, and also to supply the place of that which has been used. The amount required will depend very much upon the length of the animal's wool. The sulphur is kept floating in the bath by the agitation of the fluid, and as such it settles in the wool, acting, I have no doubt, as the chief *preventive* of scab. It is usual to dip the sheep again at the end of a fortnight, but in my opinion one *thorough soaking* is sufficient, if done in *hot liquor*. The tobacco is best boiled in bags, as it is then easily removed from the copper when its strength has been extracted. Leaf tobacco, is, I think, the best, but all the common sorts are used. Many of the settlers grow their own tobacco, but rather more of this is required, it not being very strong.

THE APPOINTMENT OF A PRINCIPAL VETERINARY SURGEON, &c., TO THE INDIAN ARMY.

By "Argus."

India; *February*, 1862.

Gentlemen,—The advisability of appointing a principal and staff veterinary surgeons in this country has been under the consideration of the government of India for some time past. A few months ago, the commanding officers of brigades of artillery and regiments of cavalry were called upon for their opinion, and the majority, if not all, were in favour of the measure. I have seen the reports of four officers, all of whom stated that they thought such appointments would be productive of good results. I have, however, lately heard that there is some intention on the part of the authorities to select military officers holding stud appointments for the duty of periodically inspecting and reporting upon the stable management of corps, the general condition of the horses, and the respective merits of the different breeds, and their suitability for the various branches of the service. Should not this form part of the duty of the principal and staff veterinary surgeons? I think so. Pray use your influence with the "Veterinary Surgeon General" at home, who, I am sure, will not fail to urge the claims of the military veterinary surgeons in India.

Last year the above duty *was* performed by military officers sent from the studs. Yours faithfully.

To the Editors of 'The Veterinarian.'

Facts and Observations.

A FRENCH SPECIFIC FOR THE FOOT-ROT OF SHEEP.

The bucolic papers speak of an effectual cure for the foot-rot of sheep, which has just been discovered by M. Bauchière, of Toulon, and which has also been considered by the Minister of Agriculture and Commerce to be of sufficient importance to warrant his sending M. Renault, Inspector-General of the Imperial Veterinary Schools, and several other gentlemen, on a mission to verify the efficacy of this new remedy.

The *Moniteur* now publishes the report of this commission, from which it appears that they visited the farm of Bois-Vert, in the commune of Arles, where they found a flock of 1200 sheep of the Merino breed, nearly all of which were attacked by foot-rot, some to such a degree that they could no longer stand, but crawled along on their knees. Fifty of these sheep were selected by the commission, and operated upon by M. Bauchière; while twenty-four others, divided into three lots of eight each, were treated according to three different methods in common use, viz., 1, verdigris and vinegar; 2, tar, turpentine, hydrochloric acid, and sulphate of copper; and, 3, calcined alum and sulphuric acid.

M. Bauchière's treatment consisted in cutting away all the parts of the hoof which had become detached, taking care to draw no blood during the operation. He then cleaned the surface of the sore, next moistened it with a brush dipped into a brownish liquid he had at hand, and, lastly, powdered it over with a white substance.

Five days after the operation, the sheep treated by M. Beauchière were found to be cured, while those subjected to the other three methods were still in a diseased state, though progressing favorably. M. Beauchière's specific is still a secret, but will, no doubt, be published.

DETECTION AND ESTIMATION OF IODINE.

M. de Luca detects minute quantities of iodine in rain and other waters, by precipitating them with nitrate of silver. The precipitate is washed and thoroughly dried, and is then introduced into a tube in which is also placed a small bottle of very thin glass filled with bromine vapour. The tube is now filled with carbonic acid gas and sealed. It is then

shaken to break the bottle and liberate the bromine vapour, which immediately decomposes any iodide of silver, setting free the violet vapours of iodine. These condense in the cold part of the tube, and may be dissolved out by alcohol. The amount of iodine may be estimated by a standard solution of sulphurous acid, and the hydriodic acid may afterwards be reconverted into iodide of silver and weighed. The process gives very exact results; as it is conducted in a sealed vessel, no loss is experienced.

THE INSTINCT OF APPETITE.

Chemical analysis and physiological research have established beyond dispute that every article of food and drink is composed of elements differing in quantity or quality. It is equally true that the various parts of the human frame are different in their composition, as the bone, the flesh, the nerve, the tendon, &c. But there is no element in the human body which is not found in some article of food or drink. A certain normal proportion of these elements, properly distributed, constitutes vigorous health, and forms a perfect body. If one of these elements be in excess, certain forms of disease manifest themselves; if there is not enough, some other malady affects the frame. When the blood contains less than its healthful amount of iron, it is poor, watery, and comparatively colourless; the muscles are flabby, the face pale, the eyes sunken, the whole body weak, the mind listless and sad. If the bones have not enough lime, they have no strength, are easily bent, and the patient is rickety; if there is too much lime, then the bones are brittle, and are broken by the slightest fall or unusual strain. The highest skill of the physician in these cases consists in determining the excess or deficit of any element, and in supplying such food or drug as will meet the case; when the medical attendant cannot determine what is wanting nor furnish the supply, nature is often loud enough in her calls, through the tastes or appetites, to indicate very clearly what item of food or drink contains the needed elements; this is the "Instinct of Appetite." Chemistry is unable to say of but one article of human food that it contains all the constituents necessary to supply the human body with every element requisite for its welfare, and that is pure milk, as supplied by the mother of the new being; but after the first years of life the body demands new elements, in order to enable it to meet the duties which increasing age imposes;

hence, nature dries up this spring, as being no longer adequate, and compels the search for other kinds of sustenance, showing that milk is a proper sole food for the young ones; and healthy grown persons who live upon it mainly will always become invalids.

All kinds of life, whether vegetable or animal, have within them a principle of preservation as well as of perpetuity; were that not the case all that breathes or grows would die; this principle or quality is common to man and beast and all that springs from root or seed; it is named "instinct." It is instinct which calls, by thirst, for water, when there is not fluid enough in the system. It is instinct which calls for food, by hunger, when a man is weak and needs renovation. It is curious and practically valuable as a means for the removal of disease, to notice the working of this instinct, for it seems to be almost possessed with a discriminating intelligence; certain it is, that standard medical publications give well-authenticated facts showing that following the cravings of the appetite, the animal instinct, has accomplished far more than the physician's skill was able to do; has saved life in multitudes of cases, when science has done its best, but in vain.

ASYLUM FOR WORN-OUT HORSES IN RUSSIA.

A SINGULAR establishment exists in Russia—the imperial hotel for old worn-out horses, built in the park of Tzarkoe Selo, for the reception of animals employed in the service of the emperor. A special cemetery is annexed to the building, and tombstones record the names of the horses buried, those of the sovereigns who had ridden them, as well as the battles and memorable events at which the animals had been present.

SUBSTITUTE FOR HUMAN MILK.

IT has been stated that cows and goats fed exclusively upon *beet-root* yield a milk exactly like that of the human secretion, and therefore may be substituted for it.

LEAD IN FILTERING PAPER.

M. WICKE calls the attention of toxicologists to the fact that some filtering papers contain lead. A piece four inches square yielded him a distinct precipitate of sulphide of lead.

THE VETERINARIAN, JUNE 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

ANNUAL MEETING OF THE PROFESSION.

The eighteenth anniversary meeting of the Royal College of Veterinary Surgeons was held on Monday, the 5th ult., in the Council Room of the College, 10, Red Lion Square. The attendance was about equal to that of former years, and among those present we observed F. R. Silvester, the president; Professors Spooner, Simonds, and Gamgee; Messrs. J. Wilkinson (Veterinary Surgeon-General); Robinson, Lepper, Pritchard, Mavor, Lawson, and Cartledge, members of the Court of Examiners; and Messrs. J. D. Barford, H. T. Batt, E. Braby, J. C. Broad, W. Burley, H. J. Cartwright, W. H. Coates, J. Crowhurst, C. Dickens, J. Ellis, W. Ernes, W. Field, jun., A. Gaskin, jun., W. Helmore, R. L. Hunt, J. Lawson, jun., J. Legrew, C. Lowe, W. Megennis, W. Pritchard, W. A. Russell, J. T. Sharp, E. Stanley, Edw. Stanley, jun., F. Walker, W. Watson, W. Wilson, S. H. Withers, H. Withers jun., Joseph Woodger, J. Woodger, jun., E. Woodger, and R. Vines.

The President having taken the chair, called on the Secretary, Mr. Coates, to read the advertisement convening the meeting, which being done, the minutes of the previous general meeting were confirmed. This was followed by the reading of the subjoined.

Abstract of the proceedings of the Council during the year 1861-2.

"Since the last annual meeting the College has been deprived of the valuable services of its late Secretary, Mr. Gabriel, and cannot let the present opportunity pass without expressing how much it feels the loss of an officer, who, from the commencement of its existence, has exhibited an unequalled interest in its welfare and progress. Mr. Braby having kindly undertaken the Secretaryship of the College, *pro tem.*, the Council took steps, by public advertisement, to

fill up the vacancy, which was done by the election of Mr. W. H. Coates, the present Secretary.

"The Council, in its anxiety to elevate and improve the position of the profession, has initiated a course of action, with a hope of ultimately obtaining at the hands of Parliament such assistance as will ensure to the members of the Royal College the exclusive right to the name of Veterinary Surgeon, and such exemptions as are enjoyed by the members of the medical profession, and it earnestly invites the co-operation of the veterinary public.

"During the past year science has lost its most illustrious and foremost patron, in the death of the late great and good Prince Consort. Your representatives, participating in the national and universal sorrow, placed the expression of their deep sympathy and condolence at the foot of the throne, and received a gracious acknowledgment from the Right Hon. the Secretary of State.

"'To the Queen's Most Excellent Majesty.

"'May it please your Majesty,

"'We, the President, Vice-Presidents, and Council of the Royal College of Veterinary Surgeons, actuated by the feelings which now move the hearts of your Majesty's subjects, desire humbly to approach your Royal presence with sentiments of the most reverent affection and heartfelt sympathy with your Majesty, on the melancholy occasion of the decease of his Royal Highness the Prince Consort.

"'Never has a bereavement struck so deeply into the hearts of a sorrowing people.

"'In the sacred relations of domestic life, by his distinguished abilities, earnest devotion, and untiring zeal for the national welfare, the late illustrious Prince commanded the admiration and won the esteem of all classes of your Majesty's subjects.

"'We cannot too fully appreciate the vast benefits which have resulted from the great interest ever taken by the late lamented Prince in the progress of medical improvement in all its branches, and from the great encouragement afforded by him to the various schools of science, literature, and art.

"'That the God of all consolation may comfort, support, and bless your Majesty, and that you may long continue to reign over a faithful and devoted people, is the earnest prayer of your Majesty's most loyal and obedient subjects.

"'By order of the Council, given under our common seal, this 31st day of January, 1862, in the presence of

"'F. R. SILVESTER,

"'*President.*'

"'WHITEHALL;
"'*8th February*, 1862.

"'SIR,

"'I have had the honour to lay before the Queen the loyal and dutiful Address of the President, Vice-Presidents, and Council of the Royal College of Veterinary Surgeons, on the occasion of the death of His Royal Highness the Prince Consort.

"'And I have to inform you that Her Majesty was pleased to receive the Address very graciously.

"'I am,
"'Sir,
"'Your obedient Servant,
"'G. GREY.'

"'*The Secretary*
"'*to the Royal College of Veterinary Surgeons*,
"'10, Red Lion Square.'

"The Financial Statement is laid before the members of the Royal College, who will see that the disbursements of the past year have been heavy, but the bulk of the expenditure may be said to be exceptional, inasmuch as some of the items may not enter into the accounts again for a few years; and the Council is sanguine that the funds of the College will, from time to time, receive a steady and substantial increase. The balance in hand, after defraying the expenses of the year, is £391 6*s*.

"Amongst the losses which the profession has suffered by death we have to lament that of Professor Delafond, of the Imperial Veterinary School at Alfort. He was a man of great scientific research and veterinary erudition.

"Among our professional brethren we have to record many deaths, of which we have no legitimate date. During the past year there have been fourteen deaths; and during the same period the number of pupils who have obtained the diploma of the College is seventy-eight; fifty-nine from the London, and nineteen from the Edinburgh schools.

"W. H. COATES,
"*Secretary.*"

The discussion following the reading of "the Abstract," and which we append, so well expresses the present position of veterinary affairs, that it is almost superfluous to add any further observations thereon. It amply supplies many of the omissions and defects of the Annual Report, which we had hoped would have been what all such documents really should be, viz., a faithful epitome of the year's proceedings. There are circumstances, however, connected with the present Report,

which lead us to modify the remarks we otherwise should feel it our duty to make. Exceptional cases must not be too severely dealt with, unless they involve the sacrifice of a principle or are likely to be made a precedent for future proceedings. These things cannot, we believe, occur again. The new Secretary will have much to do to bring matters into proper form, but we have no fear of his being found otherwise than equal to the task, nor can we doubt his determination to leave no effort untried to accomplish the desired end. We have already stated our resolve not to comment too severely on any part of "the Abstract," but, nevertheless, we cannot refrain in the most friendly spirit from asking by what species of reasoning the lamented death of a deservedly distinguished French professor of veterinary medicine can be shown to belong to the Proceedings of our Council? Surely it had no part or lot in the matter. Sincerely do we lament the loss that science in general has thereby sustained. It is, however, our duty, and we trust equally our desire, to be silent on the mysterious dispensations of an all-wise Providence.

We regret that things foreign to the real matter of "the proceedings" should be introduced. Let them be noted in the right manner, and at the right time, and we cannot say aught against it.

To pass to our report of the meeting.

On the motion of *Mr. E. Stanley*, seconded by *Mr. Vines*, the Report was received.

Mr. Vines then called attention to the finances of the College. After nineteen years' existence there was only a balance in favour of the funds of three or four hundred pounds; and if it had not been for the pupils' fees, the corporation would now be in an insolvent condition.

Mr. Ernes said the finances were in as bad a state as they could be; the income was reduced, and the expenditure increased; hence the state of their funds.

Mr. Helmore said the finances might certainly be in a worse position, for there was a balance on the right side. With regard to the efforts about to be made to secure to members of the corporate body the exclusive privilege of assuming the title of veterinary surgeons, he wished to know whether any leniency was to be shown in favour of those who had entered the Veterinary College, but had not the good fortune to pass.

Many persons had received a portion of the education of the College, and from want of opportunity, or inducement, or inclination, had never become members of the body corporate —men who were respected in the places where they lived, and with whom he was not ashamed to work as a member of the College. From having been to the College they had received an insight into the elements of veterinary science, and were enjoying the fruits of their labours, receiving an income, perhaps, of seven or eight hundred a year. He wished to know if such men were to be treated in the same manner as those who had never entered the College at all.

The Chairman said that the committee appointed to consider the subject had not made their report to the Council, and he was therefore not in a position to answer Mr. Helmore's question.

Mr. Wilkinson said that he should be sorry if the proceedings terminated without a favorable reply being given to the question put by Mr. Helmore. As far as he was concerned, as a member of the Council, he should be happy to give the most liberal construction to the proposition that had been advanced.

Mr. Helmore asked if anything would be communicated to the members before the next annual general meeting.

The Chairman said that every practitioner had had a circular sent to him, and that the Council were at all times happy to receive suggestions from members of the body corporate as to any course which they might think it desirable for the Council to pursue.

Mr. Ernes said that it was difficult to know how to deal with persons in the position of those mentioned by Mr. Helmore. He believed that they ought to be very lenient towards them, and the more they could bring to the body corporate the better it would be. They were not acting for the past, but for the future; and if they went to Parliament to obtain an Act making it a misdemeanour for persons to practice without the certificate of the College, it might be well to provide that those who had been in practice for a certain number of years should be allowed a certain time to present themselves before the College, so as to be registered as members. If they could not obtain an Act to have the exclusive privilege of practising, they ought to obtain one which would make it a misdemeanour for any person not provided with a diploma of the College, or belonging to either of the schools, to assume the name of veterinary surgeon, or any other name that would lead the public to suppose that he was a member of the body corporate. When he spoke of

the finances as being in the worst possible state, he did so with the recollection of the fact of the Society having been in existence so many years; they ought to have harboured their resources in such a way that they would now be in a position to carry out the object for which the charter was obtained without any appeal to the members for subscriptions.

Mr. Gamgee remarked, that there were about 250 persons practising with the certificate of the Highland Society. It would only be just to recognise the fact, that these persons had some sort of right to practise, and an inducement should be held out to them of a practical examination, which would bring to the College a considerable amount in fees, and also add to the number of veterinary surgeons properly so called. He should be loath to take the period during which a man had practised as a standard, as in that case any old castrator in the country might be brought in amongst them. They should be careful to maintain the respectability as well as to increase the numbers of the profession.

Professor Spooner said—I feel that an occasion like this is one which should not be passed over on the part of the members of our profession without expressing their sentiments with reference to the working of the charter, from its commencement to the present period. The remarks which fell from Mr. Vines were very pertinent. The College has now been in existence some nineteen years, and we find that it possesses a property of £391 6*s.* which is by many considered a very small sum. The question for us to consider is, upon what does the smallness of the amount depend? If it arises from any extravagance on the part of the members of the Council, then there is great cause for reprehension; but neither Mr. Vines nor Mr. Ernes has shown that any extravagance has been committed by any of the members of the Council throughout the whole of our career; and, as a member of that Council since the charter was granted, I am prepared to say that the funds have been most carefully and economically dealt with. The only source of income to the College is the fees paid by the pupils on their examination, and for their diplomas. With regard to the schools, we find that at the late examination a greater number have been examined from Mr. Dick's school than in any previous year, since he seceded from his connection with the corporate body, so that the funds accruing to the College this year will be greater than those received from any examination for some years past. We may therefore congratulate ourselves upon the state of our funds, in-

stead of deploring their low condition. With regard to the exclusive right of employing the title of veterinary surgeon, I should be inclined to contend that the charter itself gives us that privilege. (Hear, hear). The preamble sets forth that we were about to receive very important privileges; but, unfortunately, as you read the clauses, you find that the only privileges bestowed upon the members of the profession by the charter consist, first, in our being incorporated as a body, and being thus capable of suing and being sued; and secondly, that we shall be considered as members of the veterinary profession under the title of veterinary surgeons. I really believe that a man practising under the title of a veterinary surgeon without a diploma is performing an illegal act. In applying, however, to Parliament to obtain exemptions or privileges, if members of our profession suppose that we are going to do away with quackery, depend upon it they are in error. The day has gone by when the legislature is at all likely to place such restrictions upon the community as to prevent individuals from employing whom they think proper, so long as those employed do not appear under false colours. I exerted myself with several members of Parliament to obtain an Act some years ago, but we did not succeed. That, however, should not deter us from making further applications; but I think that no Act of Parliament which would be granted would ever have a retrospective action, and persons previously practising would not be affected. That was the case with regard to the Apothecaries' Company and the College of Surgeons, and it will be the case with our profession also. With regard to the assumption of the title of veterinary surgeon, I confess, I blush to see that articles appear in our veterinary journal by writers, not members of the College, who are permitted to append "V.S." to their names. I think, if we were determined only to affix to the names of those who were really members of the corporate body which are justly due to them, very considerable advantages would accrue to us as a profession. Depend upon it, however, that whatever we may say or do with reference to this point, the progress of our profession, our success in life, and the obtainment of that position to which, as members of a scientific body, we have a just right to aspire, will not depend upon any suppressive Acts that we may be able to obtain, but it will depend mainly upon ourselves, upon our own conduct, and upon our proving to the public that we are not only men of science, but men of practice and of intelligence; that we are honorable and honest men, unanimous in our

feelings, and desirous of exalting our profession to the position to which it is entitled.

Mr. Ernes, in moving the adoption of the report, said that the charter gave them no power to act in reference to the improper assumption of the title of veterinary surgeon, for if an injunction was obtained against an offending party, he might assume the title the next day, and the charter would be ineffectual. An Act of Parliament was their only remedy.

Mr. Helmore seconded the adoption of the report, which was unanimously agreed to.

The Chairman stated that the next business was the election of six members of Council, in place of those who retired by rotation, and one member in the place of Mr. Gabriel, resigned.

The following members were then proposed:

Mr. Ellis (Liverpool),	by Professor Spooner.
Professor John Gamgee,	,, Mr. Hunt.
Mr. Robinson (Tamworth),	,, Professor Simonds.
Professor Simonds,	,, Mr. Ernes.
Professor Spooner,	,, — Legrew.
Mr. Wilkinson,	,, — Helmore.
— Legrew,	,, — Wilson.
— Coates,	,, — Mavor.
— C. Secker,	,, — Cartledge
— Batts,	,, — Woodger.
— Cox,	,, — W. Field, jun.

Mr. Cartwright and Mr. Lowe were appointed scrutineers to examine the balloting papers. During the time thus occupied—the discussion was continued, and

Mr. Gamgee observed that he was desirous of calling attention to a subject which was especially interesting in Scotland and to the profession at large. Their difficulty in Scotland had been undoubtedly great, and they were indebted to the Council of the Royal College of Veterinary Surgeons for the manner in which it had strengthened their hands and enabled them to face an opposition which was none of the lightest. It was essential that in Scotland the College should be represented as not being a London institution, because the Scotch rather hated London centralization. This had been accomplished in a very fortunate manner by adopting certain resolutions which had been proposed at the late meeting of the Board of Examiners, so that he believed that little more remained to be done—perhaps nothing more than to allow

matters to take their own course. At the same time it was important that the Council, or the members generally, should take cognizance of any very flagrant act, on the part of any body of men in Scotland, tending to injure the College. Such an act had recently occurred, and he desired to call the attention of the members to it. A report had appeared in the Edinburgh papers, that at the meetings of the examiners of the Edinburgh College, and at a dinner of that body, there were present the President of the Royal College of Surgeons and the President of the Royal College of Physicians of Edinburgh. No doubt those individuals might attend dinners and examining boards as often as they liked, but when he saw them paraded before the public as "Dr. Newbegin, President of the Royal College of Surgeons," and "Dr. Cragie, President of the Royal College of Physicians," he thought that it was time that they should represent the matter to those public bodies, and ask for their assistance on behalf of the veterinary profession in its legitimate working. It was true that they would be stepping upon delicate ground, but he believed, from the feeling which existed in Scotland, and especially in Edinburgh, to support everything that was proper and legal, that if the charter was transmitted to the College of Physicians and the College of Surgeons, and a statement made that the Presidents of those bodies had been giving their official sanction to an illegal board, no harm could be done, and some benefit might be derived. It was a serious matter in a place like Scotland to have such gentlemen formally acquiescing and taking part in meetings which were illegal. He believed that there was a feeling in favour of the Royal College, and as it increased the favour exhibited towards illegally constituted boards would necessarily diminish. But they ought not to be blind to the fact that, whereas many students now presented themselves to the legally constituted board in Scotland, all the students of one of the colleges sought the certificate of the Highland Society; and so long as they were not strong enough to bear up against that temptation, it was important that the members of the profession should do all they could to enlighten the public mind on the subject.

Professor Spooner said this was no new subject, and it had unfortunately created a great deal of unpleasantness among the members of the body corporate almost from the first granting of the charter. It would be borne in mind that before the charter Mr. Dick's school and the London College were in existence, and each of them possessed its own examining board. After the obtainment of the charter, Mr. Dick, who was one of

the petitioners, evinced a desire to act harmoniously with the other members of the corporation, and suspended his board for a time until circumstances occurred which met with his displeasure and also that of the Highland Agricultural Society. He then thought proper to withdraw his connection from the corporation and to revert to his former mode of examining pupils, leaving them to be subsequently examined by the Royal College of Veterinary Surgeons, or not, as they felt disposed, at the same time assuring the public that they were equally entitled to all the privileges that were possessed by those who became members of the corporate body. That assurance was to all intents and purposes a correct one, because it had been shown that the gentlemen who passed the court of examiners instituted by the Highland Society were admitted into the army and were practising in various parts of the kingdom. This was very much deplored, and some stringent measures were instituted, which, however only tended to give considerable offence, and retard their arrival at the goal at which they were all aiming, namely, perfect unanimity of sentiment amongst the corporate body and those who were educated at all the recognised schools. As had been already stated, during the last session a greater number of Mr. Dick's pupils had been examined by the Board of the Royal College of Veterinary Surgeons than on any previous occasion, and they had, therefore, a right to suppose that in the course of time the evil would work its own cure. He had had correspondence with Mr. Dick upon the subject, and he had reason to believe that everything would ultimately work for the common good, if they did not attempt any coercive measures. Profesor Dick's board had been called an illegal one, but it was not so. Every school had a right to institute its own court of examiners, and if the pupils were contented with the diploma they received, no one had a right to complain. The charter itself implied the right of the schools to teach and examine their pupils. If the pupils, in addition to receiving the certificates of their own schools, desired to become members of the corporation, of course they must pass the Court of Examiners as instituted by the corporate body. With regard to the London School, it abolished its Court of Examiners when the Royal College was established, and it gave its pupils no certificate expressive of their qualifications to practise; but after they had passed the examination of the Royal College of Veterinary Surgeons, the school gave a certificate specifying that they had been duly educated in the various branches of science connected with the profession. He did not think it would

be advisable to have recourse to any measure that would be calculated to give offence to the President of the Royal College of Surgeons or the Royal College of Physicians of Edinburgh, by appealing to any authoritative power to deter them from acting as they had done. If they took any step in the matter, it should be with the Highland Agricultural Society, to show them that it was their duty to withhold the sanction at present given to an examination instituted by a school which was only teaching under the Queen's sign manual, but had no power to incorporate the individuals who passed its examination.

Mr. Gamgee said the reason why Professor Dick's pupils had come to the Royal College of Veterinary Surgeons was that they had established a new college in Edinburgh, and placed the board in such a position, as to satisfy the students that they must have its diploma, so that coercion had succeeded where attempts at reconciliation had failed. He thought that Dr. Craigie and Dr. Newbegin had acted in an unconstitutional manner, and he thought a polite communication should be sent to them, on the assumption that they were ignorant of the corporate body; therefore such a measure would not be coercive, but really asserting their own rights and privileges. If these public bodies were addressed in a proper way, the matter would be discussed, and no doubt a satisfactory conclusion would be arrived at.

Mr. Robinson said that Mr. Dick's board was granted by the Highland Agricultural Society as a necessity at the eleventh hour. When Mr. Dick had got thirty or forty pupils to come before the board of the College, not one of them could be admitted, in consequence of a bye-law requiring them to serve an apprenticeship of three years. Not one of his pupils could then have been examined but for the new board which was established. He did not think that they were to be blamed for the steps they had taken.

Mr. Gamgee said the examiners were not appointed by the Highland Society, but really by a letter from Mr. Dick.

Mr. Robinson said the Society gave him his first board in 1847, and he had had it ever since. He believed the less stir they made in the matter, the better they would be satisfied in future.

Mr. Wilkinson said Mr. Gamgee knew better than any of them what it was to deal with a Scotchman, and was well acquainted with the motto, *Nemo me impune lacessit.* He believed that a letter to the Presidents of the College of Physicians and College of Surgeons, however carefully worded, would be resented as appearing like dictation. He believed that the

prospect of amalgamating the various schools under one head was brighter than it had been for some years past, and he further believed it would be brought about by a conciliatory course of action, inviting rather than demanding. No doubt Mr. Gamgee was aware of what had recently taken place in Edinburgh. In the 'Scotsman' there had appeared an epitome of the proceedings of the Board of the Royal College of Veterinary Surgeons at Edinburgh. Dr. Miller and Dr. Struthers had spoken on the subject, and he had read their speeches with the greatest pleasure. One of them drew attention to the pupils who had passed, and the other laid down the law in such a way as would, no doubt, enlighten the very gentlemen to whom Mr. Gamgee referred, and open their minds as to the real nature of the charter.

The scrutineers now presented their report of the ballot, upon which

The Chairman declared the election to have fallen upon Professor Spooner, Professor Simonds, Mr. Wilkinson, Mr. Robinson, Mr. Ellis, Mr. Legrew, and Mr. Coates.

Mr. Ernes said that they ought not to separate without passing a vote of thanks to the President for his services during the past year. There was no one who paid more attention to the business of the Council than Mr. Silvester, and the thanks of the members were due to him.

Professor Spooner seconded the motion, and said that the members of the Council were much indebted to Mr. Silvester for the able manner in which he performed the duties of his office.

The motion passed by acclamation.

The President acknowledged the vote of thanks, and the proceedings terminated.

Extracts from British and Foreign Journals.

PLEURO-PNEUMONIA IN AUSTRALIA.

Report of the Commissioners.

The Honourable the Secretary for Lands, Sydney.

SIR,—Having brought to a close the labours which you did us the honour to impose upon us, respecting the disease called pleuro-pneumonia, unhappily prevailing in the country, we will now attempt to generalise some of the leading facts which have come under our observation, and to lay before you the deductions which present themselves to our minds, on the various subjects to which our attention has been directed. In conformity with your instructions, we have communicated frequently and fully, both by letters and by telegrams, our views and the reports of the veterinary surgeon. From these, we hope you will have been able to comprehend the difficulties we have had to encounter in dealing with this investigation, which, by reason of the diseased country embracing a much larger area than was anticipated, has been protracted far beyond our expectations.

The highest powers of veterinary skill have been taxed in vain to discover the primary causes of this disease, or to arrest its devastating progress. In its early stages its course is so insidious as to escape the notice of all but practised eyes. As a proof of this we have only to state that in one case only has the disease been reported to us before discovering it by our own investigations, notwithstanding that our examinations have extended over herds containing on the whole not less than 100,000 head of cattle, amongst all of which, with ene or two exceptions, the disea-e has been found. So far as our investigations enable us to judge, neither age, sex, nor condition seem to resist its inroads; neither food, temperature, nor locality appear to have any influence in arresting its onward course. A disease so malignant, a calamity so appalling, urgently demanded the intervention of the Government; and we sincerely regret that the promptitude that has been displayed should so far have been unsuccessful as to fail in extirpating the malady.

Although pleuro-pneumonia has but lately made its appearance in the Australian colonies, it is no new disease to the European farmer or veterinary practitioner. For a couple of

centuries epizootic pneumonia has ravaged the herds of various states. An account of a species of pneumonia mingled with pleurisy was published in 1833 by M. Lecoq, of the Veterinary School of Lyons, which describes general symptoms precisely similar to those of the disease which at present prevails here. Analogous diseases have occasionally made their appearance in the United Kingdom; but for upwards of twenty years past the malady, now known as pleuro-pneumonia, has from time to time been raging with great intensity and destroying vast numbers of cattle there.

It was first introduced into the colony of Victoria about three years ago, by a cow imported from England by Mr. Boadle; and has been traced from her to the borders of New South Wales.

With pleuro-pneumonia in our immediate neighbourhood, prompt and vigorous measures became necessary to prevent its introduction into this colony; and an Act was passed by the legislature, in the month of April last, with that object in view. This was unquestionably a commendable course to pursue; but, without inspectors to guard the Murray boundary, it was utterly impossible effectually to hinder its violation. Large numbers of store cattle were taken into Victoria from New South Wales, and every one acquainted with the habits of cattle knows with what pertinacity they seek to return to their old runs. The Murray River would be but a slight obstacle to the gratification of this instinctive desire, and it is now certain that cattle crossed in considerable numbers. At the time the proclamation under the Act was promulgated there were many bullock teams on their way to New South Wales from Melbourne with goods. It is a well-known fact that many of these teams were left on the other side, and the drays were brought across; but it is also a well-known fact that the bullocks diaappeared quickly from the south side of the river, and the drays as quickly vanished from Albury. There cannot be a question but that the law has been evaded, and that bullocks have been brought over, and the drays and loading removed, during the night-time. It is estimated that some hundreds of bullocks have been brought over in this way, and it is likely enough that they have been instrumental in disseminating the disease in this colony.

The first appearance of pleuro-pneumonia in New South Wales was in the herd of the Messrs. M'Laurin, of Yarra Yarra, at the head of the Billy Bong Creek, about the beginning of August last. It was said that this herd was infected by a number of store cattle brought by these gentlemen upon that station in the month of February last, from the Mitta

Mitta River, in the vicinity of which the disease had been found. The Messrs. M,Laurin deny any knowledge of the existence of the complaint about the Mitta Mitta, when their cattle were removed; and they advance as a reason why they could not have been infected at the time, that three or four hundred head left behind on the run have not even yet exhibited the slightest symptoms of disease.

We are not at all disposed to doubt the perfect truthfulness of these statements, but still we are of opinion that they are not conclusive against the assumption that the disease might possibly have been introduced into the Yarra Yarra herd in this way. Pleuro-pneumonia was, about the time of the removal of Messrs. M'Laurin's cattle from the Mitta Mitta station, discovered very near to it; and it is possible, therefore, that the seeds of the disease may have been sown amongst them before they left, which might have required some time for development. It was not necessary that the whole herd should have been infected in the first instance. It would have been sufficient that one or two infected beasts had been taken to Yarra Yarra. The dissemination of the disease might, no doubt, be accelerated by the usage the cattle sustained, by being tailed closely during the day, and pent up together in very wet yards, and in cold weather during the night, for a length of time. The cold would predispose to an inflammatory state of the lungs, and the close intercourse would render the disease more easily communicated.

On the other hand, we are free to admit that there are many other ways in which the disease might have been introduced into this herd. The Yarra Yarra station is bounded by the Great Southern Road for six or eight miles; and before the Cattle Disease Prevention Act came into operation, teams of working bullocks from Victoria travelled in that direction in considerable numbers, and probably camped on the run. Some of these might not only have been infected, they might have died of the disease on the very station. The pasture might have become infected with the malignant saliva, the surrounding atmosphere contaminated with the malaria. Stray beasts, too, from the numerous herds of store cattle taken into Victoria from this colony might, in their effort to return to their old runs, have passed over the station, or even remained on it to communicate the evil.

Besides, we have been informed that a working bullock, which had been brought from Victoria in a team to Albury, just before the Act came into force, had strayed on to Messrs. M'Laurin's run, and that this bullock, when slaughtered with their cattle, was found to be infected with chronic pleuro-

pneumonia. We believe that the disease was likely to have been communicated by this beast.

We are at all events satisfied that the Messrs. M'Laurin did not know at the time they took their cattle from Mitta Mitta that any disease was amongst them, and that these gentlemen did not neglect any reasonable precaution to prevent its introduction into the colony.

Although we have not, in this case, been able to trace with certainty the infection from one beast to another, we do not entertain the shadow of a doubt of the disease itself being infectious in the highest degree. Some of the links of the chain may have escaped notice, but they were in existence nevertheless. In other cases the connection throughout has been so manifest as to defy disbelief. Mr. Veterinary-surgeon Pottie is strongly of the same opinion, as well as Mr. Smith, the Victorian commissioner at Albury, whose experience in the investigation of this disease in the sister colony has been considerable. However much Professor Dick and some others may have argued against the infectious nature of pleuro-pneumonia, no practical or sane man will ever think of bringing diseased cattle amongst his herd, and hope to escape with impunity.

With respect to Terry's bullocks, which were found infected near Campbeltown, we have not been able to obtain such information as to connect them with other diseased cattle. We ascertained that, in the month of April last, he brought loading with bullock teams to Mr. Thomson, of Wagga Wagga, and it was thought that at that time he went some distance down the Murrumbidgee to his brother's residence, but we could not find that he had gone any further towards Ten-mile Creek or the country known to be first infested.

We shall now consider the steps that have been adopted, and how far they have been successful.

The manner in which the disease first appeared at the Yarra Yarra station has been already described. Our colleague, Mr. Bruce, was appointed an inspector in the early part of September last, with power to have all the diseased cattle on the station destroyed, so soon as the symptoms made their appearance. From the voluminous reports, letters, and suggestions which he has forwarded to your department, and the information they afford, we think it advisable, as they tend to throw considerable light on the early stages of the disease in the colony, to enclose them in a collected form. We regret, however, that his exertions were not successful. His reports too plainly show the rapid and uncontrollable progress of the disease in the herd, notwithstanding

that the work of destruction was going on, and the mingling of the cattle with those on Mr. Bowler's station quickly brought the latter into the same condition. The disease was now general throughout these two herds; and the Government, under the impression that it was still confined to them, and might yet be extirpated, determined on the total destruction and consumption by fire of the whole of the cattle on those stations, promising, at the same time, a certain compensation. A very large colonial interest was at stake, and the measure, under the circumstances, was perfectly justifiable. Had it been successful—and it was impossible to foresee, with what was then known of the disease, that it would not—the service rendered to the country would have been incalculable. Unfortunately it was a work of greater labour and of more difficulty than was anticipated. It was also an unfortunate circumstance that the disease should have first appeared in those two herds, as many of the cattle in each had recently been obtained from other runs, to which they would, of course, be disposed to return. A portion of Messrs. M'Laurin's cattle, as we have already mentioned, were brought from the Mitta Mitta River, and some from another station belonging to them on the Edward River. Part of Mr. Bowler's herd had been purchased from Messrs. White and other gentlemen on "The Levels," in the Lachlan district. Towards each of these places it was found that the cattle were straying back, and mixing with other cattle on their way—sometimes one or two remaining in a herd, while others would persevere in their journey towards their old runs. These cattle were followed, and as many of them as could be found were destroyed; but, without a doubt, the infection was disseminated by them as they went along.

Mr. Bruce, finding that no precautions which he could take—no power which he could exercise—prevented the disease from making its appearance on adjoining runs, sought the assistance of two practical gentlemen in the neighbourhood to aid him by their experience and advice in forming a line of demarcation between infected and uninfected lands. Our colleagues, Messrs. Day and Meyer, were nominated, and their appointments confirmed by the Government on the 13th November. These gentlemen, in conjunction with Mr. Bruce, immediately set about examining the herds in the neighbourhood of Ten Mile Creek, and on the 21st November sent the following telegram to your department:—"Being alarmed by the extent of pleuro-pneumonia on the west and south-west side of Yarra Yarra, we separated and tried the country in other directions. We have traced the disease from the Murray,

fifty miles towards the Murrumbidgee, and 40,000 cattle would now be condemned." Here was truly an alarming state of things, which the subsequent reports of the veterinary surgeon too fully confirmed. The matter was immediately brought before Parliament, and a commission was appointed to investigate and report upon the best course to be adopted in such an emergency. We had the honour to receive your commands to carry out, with the assistance of Mr. Veterinary-surgeon Pottie, the objects of this commission, and we will now endeavour to convey some account of the labours which devolved on us.

On the morning after Mr. Garland and Mr. Pottie arrived at Ten Mile Creek from Sydney, they, accompanied by Mr. Bruce, went to the Yarra Yarra station for the purpose of seeing the disease in all its stages, and remarking its symptoms and peculiarities. The living and post-mortem appearances of the cattle have been fully described by Mr. Pottie. Let it suffice to say that these appearances were but too indicative of the thorough prevalence of this lamentable scourge.

The way in which the cattle were destroyed was this:—Yards were erected on the banks of a narrow gully, and some hundreds of cattle were driven into them at a time. These were again put in smaller lots in the slaughtering yard, which, being high, was covered over like a network on the top with planks, upon which men walked, and with pointed goads pithed the cattle. So soon as the whole were down, some men set about bleeding and opening them for the purpose of inspection. The age, brands, and state of disease of each beast were recorded, and the carcasses were then drawn into the gully by a team of bullocks, for consumption by fire.

We append a return (No. 1) of the cattle slaughtered at Yarra Yarra, and also at Bowler's station. The destruction of property at first sight may appear very great; but when we consider the small number of sound cattle in each case, and that probably with a more careful examination they would have been found still fewer, we must see that the sacrifice is not so serious after all.

When Messrs. Garland and Bruce returned from Yarra Yarra to Ten Mile Creek, on the 30th November, they were joined by Messrs. Day and Meyer. The board was then duly constituted, and deliberations commenced that night, the results of which we had the honour to communicate to you. Upon that occasion our most important recommendation was the prohibition against the removal of stock from the

greater portion of the pastoral district of Murrumbidgee to any other part of New South Wales. This was only intended as a temporary measure, and our decision was not rashly or inconsiderately arrived at. Some of the commissioners, whose experience and information enabled them to form a more accurate estimate of the extent of the disease, were of opinion that, if a comprehensive prohibition was not in the first instance maintained, to keep the infection, if possible, within some certain limits till its actual bounds could be ascertained, the quarantines on infected runs merely, as they were found to be so, would be a sham and delusion, while every freedom was allowed to the stock on runs not examined, but perhaps more diseased, to go where they pleased. The owners of such runs would send off whatever stock they wished to dispose of, before the inspection reached them; and thus the infection would precede the examination, without any fixed line to arrest it. Besides, we are of opinion that no imaginary boundary over an open country, without some natural obstacle or fence to assist in breaking the intercourse between the herds, could be effectual for such a purpose; and it was for these reasons that we recommended so much of the Murrumbidgee district to be placed under prohibition for the safety of the rest of the colony. The result has shown that, instead of being too comprehensive, the limits have not been sufficiently extended to circumscribe the malady. Besides, we found that working bullocks and herds of cattle travelling over stations which we afterwards knew to be infected, passed into the Lachlan district, in defiance of any power that the commissioners or inspectors possessed to prevent them. But, having since found that the disease extended far into the Lachlan district, of course the prohibition could be no longer of any value. Neither is it necessary that our other recommendations offered at that time be now entertained.

After leaving Ten Mile Creek we proceeded on our tour of inspection, the results of which will be gathered from our various progress reports. We append a tabulated return (No. 2) of the stations visited, and the state of the disease on each. This, however, may be far from correct as indicating the intensity of the disease on the several stations. In some instances we saw but a limited number of cattle, and we were satisfied when we found one decided case on each run, although there may have been other cattle more severely affected.

We deemed it a matter of some importance to the owners of runs about the Upper Billy Bong, whose stations had been

placed in quarantine, that they should be able to take their fat stock to the Melbourne markets, provided the Victorian commissioner should be satisfied of their being sound. If it was found that disease really existed all the way to Albury, then there would be an outlet in that direction for sound cattle from interdicted runs. We prosecuted our examinations towards Albury accordingly, and had little difficulty in tracing the disease continuously to that place. In the meanwhile we every day saw more and more the necessity for having fuller powers than the law afforded to us to carry out our examinations satisfactorily. We felt that, until regulations were proclaimed twice in the *Gazette*, in accordance with 'The Cattle Disease Prevention Act,' we had no power to do anything which might be contrary to the wishes of stock-owners; and that they were liable to no penalties if they resisted the inspectors or violated the quarantines. We therefore devoted our attention to the framing of regulations, and transmitted a draft for your consideration, but they do not seem to have met with the approbation of the Government.

From Albury we went to Wagga Wagga, and on our way we pursued our inquiries. We traced the disease to that township, and having learned that cattle from Bowler's station had been straying back to Messrs. White's, Hurley's, and Dallass's runs, in the Lachlan district, probably carrying the disease along with them, we decided on examining these runs, and discovering whether they were infected or not, and to report at once the result, giving it as a resolution passed by the Board, that if the disease had crossed the Murrumbidgee, any measures which it could think of in the shape of quarantines or prohibitions would prove ineffectual to prevent the further spread of the disease where no rivers, fences, or impassable ranges could be made available for that purpose. Messrs. Garland, Bruce, and Pottie proceeded to the Messrs. White's run, on the "Levels," where they found the disease. They therefore at once returned to Wagga Wagga, and, having reported in conformity with the resolution of the board, came on to Albury.

In the meantime Messrs. Day and Meyer had continued their inspection down the Murrumbidgee for some distance, and thence by the Urana to the Colombo and Billy Bong Creeks. They examined the stations as they went along, and found disease on them all. They reported particulars to Government by telegram, and hastened to Albury.

Much stress has been laid on the assumption that the saltbush would be an antidote to pleuro-pneumonia, but Messrs.

Day and Meyer have found it prevailing on several stations on the Urana, Colombo, and Billy Bong Creeks, where this plant is very abundant. On one of these stations (Coonong) the beast slaughtered for examination proved to be highly infected, and the external appearance of such of the herd as came under their notice evinced strong symptoms of general infection.

We may observe that the settlers generally were unwilling to acknowledge, and certainly very much annoyed to be made aware, that their runs were really infected. We were surprised to find that so little concern was manifested by them in a matter of such grave importance, and one so intimately affecting their interests. It was to be supposed that they would have visited the Yarra Yarra station to make themselves acquainted with the disease in all its forms, so as to be able to detect and deal with it the moment it made its first appearance in their own herds. We should have expected to see public meetings in all parts of the district to discuss the matter thoroughly, at which opinions could have been expressed to guide combined action on the subject; but with one or two exceptions, we do not find that anything of the sort had been done.

In compliance with the instructions contained in your telegram of the 20th of December, the board met at Albury on the 23rd, and on the same day approved of and transmitted suggestions as bases of regulations, but it appears that they were not in conformity with the views of the Government, since they have not been adopted.

Mr. Smith, the Victorian commissioner at Albury, addressed to us an official letter, requesting an interview, for the purpose of making amicable arrangements for crossing cattle into Victoria. He has to guard against the crossing of diseased cattle over the Murray from five miles above Lowong upwards to ten miles below Wagunyah downwards. After discussing the subject with Mr. Smith, we find that he will remain on this side of the river, so as to be able to examine all cattle before they cross. Should any one be so foolish as to evade his inspection, or take cattle over after he has declared them unsound, it would subject them to be immediately placed in quarantine. Mr. Smith will exercise his own judgment of the soundness or unsoundness of the cattle which he inspects, and will not object to pass any he may deem healthy; but he wishes that timely notice may be given to him by persons intending to take cattle over the river, in order to facilitate the inspection, since he has so large a frontier to guard.

When the commissioners addressed their letter to you of

the 28th December, on the subject of compensation, we were under the impression that the proclamation would be similar to the propositions indicated in your telegram of the 20th. But, instead of a limited number, as we supposed, of cattle being destroyed for the purpose of examination, and these only, we find by the proclamation of the 24th, since received, that power is given to destroy any indefinite number. Consistently with the opinions which the majority of the commissioners have entertained on the subject, under similar circumstances, we beg now to suggest that a valuation by arbitration will be the fairest mode of dealing with the subject for the future. As, however, the Messrs. M'Laurin and Mr. Bowler were led to expect a certain fixed rate at the time when their cattle were ordered for destruction, we think it would be unjust to those gentlemen to alter the rates as far as they are concerned. Nor do we think it advisable that the few cattle already slaughtered for the purpose of examination should be paid for in any other way. But for all cattle slaughtered subsequent to the date of the proclamation of the 24th of December, 1861, subject to the instruction of the Minister for Lands, we would recommend that compensation be given according to the amount fixed by an arbitrated value, arrived at in the usual way, but with a deduction of 25 per cent. on account of their being diseased. We believe that such a rate will neither tend to the concealment of the disease nor induce an indifference to its introduction.

The Commissioners have now to express their regret that, owing to the unexpected wide-spread of the disease, we have neither been able to ascertain its precise limits, nor to suggest the means of effectually arresting its progress, much less of thoroughly eradicating it. And in conclusion, we beg to offer the following remarks and suggestions, with a view to its restraint and general treatment.

We find—

1. That pleuro-pneumonia is a disease of a very highly infectious and contagious character, and cannot be detected with certainty in its early stages.
2. That from our experience it is infectious or contagious at an early stage.
3. That it was introduced into Victoria through a cow imported for Mr. Boadle, from which the infection was carried into various parts of that colony by M'Kinnon's working bullocks and other diseased beasts, until it reached the Murray border of New South Wales.
4. That, although the mode in which it has been introduced into this colony may not be definitely and indisputably ascertained, the extensive intercourse with the south side of the Murray, by herds

of cattle, stray store stock, and teams of working bullocks, leaves little doubt of its having been brought by some of these means.

5. That it has been discovered throughout that portion of the colony extending from the Dora Dora station on the Hume River to Cocketgedong on the Billy Bong Creek, in one direction, and from Albury to The Levels, in the Lachlan district, in another, which includes about 130 miles square, and about 100,000 cattle.
6. That there is every reason to believe that it has extended even much further.
7. That it is impracticable to maintain a strict quarantine effectually.
8. That it is inexpedient to slaughter whole herds or mobs of cattle.

We would recommend—

1. That inspectors should be appointed to ascertain the extent of infected country, with power to carry out the law.
2. That diseased country, as inspected, be proclaimed in *Gazette* and local newspapers.
3. That no cattle should be removed from infected runs, nor from any land within ten miles thereof, without being first examined by an inspector, who would grant certificate of such inspection, to be produced when required.
4. That cattle from infected runs should not pass through country not declared to be infected.
5. That no impounding should be carried on from or in infected country, nor from lands within ten miles thereof.
6. That when small lots of cattle within enclosures become diseased in the midst of a sound country, it may be expedient to destroy them.
7. That as working bullocks have been the chief instruments in spreading the disease, their use should be disallowed in diseased country, or within fifty miles thereof, except on the runs or farms to which they belong.
8. That inspectors should have power to order the destruction of diseased cattle driven over, or negligently allowed to stray on, land not declared infected, as well as the destruction of all cattle moved in contravention of these suggestions.
9. That solemn declaration should be made of number, brands, and state of disease of cattle so destroyed.
10. That stockowners should make themselves acquainted with the disease, and should, as much as possible, prevent intercourse between infected and sound cattle, by destroying the former, or confining them to a paddock.
11. That stockowners ought, by frequently assembling together, and by combined action, to devise means to meet every emergency of the disease as it arises, and to give every assistance in carrying out the law.
12. That boiling-down establishments ought to be erected at once, at Albury and Wagga Wagga, where they would be within reach of water-carriage, and at other places as occasion required. And with a view to the speedy accomplishment of this desirable end, the Government should offer inducement to private enterprise, either by grants or leases of land.
13. That for cattle already slaughtered for purposes of 'The Cattle Disease Prevention Act,' compensation should be paid at the rates already fixed by Government; and for all cattle destroyed

after 24th December, 1861, by one fourth less than their value arrived at by arbitration, provided the latter be killed subject to the instruction of the Minister for Lands.

14. That the Government should, without delay, instruct properly qualified persons to conduct experiments in inoculation, and otherwise to prosecute researches into the nature and peculiarities of this disease.

We would also observe that the incompleteness of the provisions of 'The Cattle Disease Prevention Act of 1861' does not admit of our proposing further measures for restraining the disease, which we would otherwise recommend.

We have the honour to be, sir,

Your most obedient servants,

JAS. GARLAND,
ALEX. BRUCE,
GEORGE DAY,
S. A. MEYER.

ALBURY, *4th January*, 1862.

P.S.—Since closing the above report, we have been informed, on reliable authority, that on the station on the Mitta Mitta River, from which Messrs. M'Laurin brought their cattle, pleuro-pneumonia is now raging with much severity among the cattle that were left behind, and that a good many of them have been slaughtered, and died in consequence. It is also stated that Mr. Patton, the present occupant of the station, has been contending with the disease for the last two months.

The circumstance does not lead us to assume that the Messrs. M'Laurin knew that their cattle were diseased before they removed them, but it tends to confirm the suspicion that the disease was imported to Yarra Yarra from that quarter, where we learn it now prevails to a considerable extent.

J. G.
G. D.
S. A. M.

ALBURY, *4th January*, 1862.

The Hon. the Secretary for Lands, Sydney.

Albury, 3rd January, 1862.

Sir,—I have the honour to add a further and fuller report of my professional investigations respecting pleuro-pneumonia epizootica, as follows:

INTRODUCTION OF DISEASE.

Pleuro-pneumonia epizootica was first noticed and first made known

in New South Wales by the Brothers Thomas and Robert M'Laurin, on their Yarra Yarra station, in the early part of August, 1861. These gentlemen did not seek to cloak the fact; but, on the other hand, ordered their stockmen to pick out every ailing beast, and had it destroyed and burned, until they had in all destroyed nearly 200 head of cattle. During this time they invited the squatters round to come and see the disease in the living and dead subjects. As they were tailing the mob in which the disease was first observed, the best of opportunities were offered for inspection. The herd was made up of cattle bred on the Yarra Yarra run, on Curnulla and Moroco, Lower Murray, and on the Mitta Mitta, Victoria, the last draft of which came over in the month of February, 1861.

As it became generally known that pleuro-pneumonia epizootica had broken out at Yarra Yarra, the settlers began to speculate regarding its introduction—one class asserting that it must have come from Mitta Mitta with the last draft of cattle; and another, that the severe system of tailing practised during the wet season must have been the means of producing the disease; while the brothers M'Laurin say that they believe that it must have been introduced among their cattle by a strange working bullock which was found among the first that they destroyed with one lung enclosed in a membranous sack, constituting the chronic stage of pleuro-pneumonia epizootica. Evidently this bullock had been at some distant period very bad, and no doubt while thus suffering was turned adrift upon the run. Another fact also adds weight to this supposition: it is this—that 300 head of the same cattle as those last brought from Mitta Mitta were left on that run, and are still free of the disease. Again, if it had been produced by the severe system of tailing there adopted, we have pleuro-pneumonia epizootica produced spontaneously on Yarra Yarra, a fact never before demonstrated, and which, coming as it now does merely as a supposition, must be received with scepticism.

Having made all the inquiry possible, I am bound to state that it is my opinion—judging from the combined history—that the strange working bullock above alluded to introduced the disease, probably before the Mitta Mitta cattle came to Yarra Yarra in February; and that, although the tailing cattle might not have been the first infected, they were the first to show symptoms of disease from the manner in which they were kept, and from being immediately under the eye of the person in charge of them.

The next two herds that were noticed were Mrs. Greene's, Billy Bong, and Mr. Bowler's, Ten Mile Creek. These two stations bound Yarra Yarra on the north and west. Mrs. Greene's cattle had been on her run for a lengthened period, while some of Mr. Bowler's had come from a station on the Mitta Mitta, and some from Mr. White's run of Merrybundinyah, in the Lachlan district. Mr. Bowler's cattle were brought from Mitta Mitta one month later than the Messrs. M'Laurin's; and certainly, though a public road passes through Mr. Bowler's Mitta Mitta station, and though from the Victorian commissioners' report I find that diseased bullocks are said to have passed that way, yet I do not think Bowler's cattle brought it, otherwise those he left would also have given evidence of the same disease. The store cattle he brought from White's do not seem to have been first attacked.

But the disease seems so virulent in some quarters so far distant from either of these runs above mentioned that we must now look for its introduction, not to one point, but to many. For instance, we have Messrs. Talbot and Smith's run of Urana Creek, and Messrs. M'Caughey and Co.'s (late Woodhouse's) station of Coonong, both in the saltbush

country, and both very badly infected. How it came there none can tell. We see cattle migrating from one part of the colony to another, and from one colony to another. They are sold, change hands, and, though often take long distances, many of them find their way back to their old runs. All this has been going on while the disease has been raging on the Victorian bank of the Murray. Bullock teams have gone and come from one colony to the other, crossing and camping just as they liked. Diseased bullocks from some of these teams may have been left on runs or strayed away on this side of the Murray. Thus the possibility for its introduction here existed in various ways; and we know that it was first taken from Boadle's farm, in Victoria, by working bullocks; and we know from the Victorian commissioners' report that working bullocks have strewed the venom of this disease across the colony. We know also that working bullocks took it to Cambeltown. All history seems, therefore, to point to these migratory herds, singling them out as the principal actors in the dissemination of the venomous seeds of pleuro-pneumonia epizootica.

SPREAD.

It is a remarkable fact, with respect to pleuro-pneumonia epizootica, that it seems to possess the power of spreading by every known and unknown channel. The laws which govern it have never been clearly demonstrated, and hence we are startled at its wondrous and rapid progress. But we become less and less so the more we know of the country, and of the habits of the cattle depasturing in that country.

Certainly the country is divided into runs, and these are divided in many cases by natural boundaries, such as creeks, ranges, and rivers, and sometimes only by lines of marked trees. But although these lines assist each squatter to know the confines of his runs, yet they do not, as a rule, prevent cattle from straying off their own runs, and they mostly roam at freedon where they like, sometimes feeding on their own runs, sometimes just over the boundary on their neighbour's, and sometimes many miles away from their regular beats.

It is a law with cattle always to return to the run on which they were bred, no matter how great the distance. Some cattle have been known to return 600 miles, while 300 is no uncommon distance for them to go back.

Cattle thus returning are subjected to a particular examination by the cattle in the various mobs through which they pass on their way back. They are strange, and the cattle on these runs surround them on their first appearance, smelling, licking, and butting them; hence, if any animal straying in this way possesses any contagious or infectious disease, it has a good chance of making rapid progress.

Coming then to Yarra Yarra and Ten Mile Creek herds, we find part of them lately brought to these runs from different districts; and we find many of these cattle afterwards leaving both Messrs. M'Laurin's and Mr. Bowler's and making for their old runs, roaming through all the stations round, and straying here and there, diseased and not diseased.

Hence we come to get a clue to the progress of a disease so subtle, yet so sure, and we have also a clear explanation of its wondrous development among the cattle running on those infected stations specified in the *Gazette* of 24th December, 1861.

NATURE.

Pleuro-pneumonia is a disease of a low typhoid nature, showing but very slight external symptoms at the period of its incubation—in fact,

so slight as wholly to exclude all chance of certain notice, especially among bush cattle. Though we do often observe among domesticated cattle that high inflammatory fever sets in when the lungs are first attacked, still we have good reasons to believe that the active element has been doing its deadly work among the component parts of the blood long before symptoms of lung attack sets in; and I believe that many of the cases I have dissected go a long way in demonstrating this fact. I am led to this inference from observing that if the blood of many of those animals but slightly attacked in the lungs be collected, a thin, milky-looking fluid gathers on its surface, which I take to be disorganized fibrine, and I believe fibrinous effusions take place very early in the lungs after they are attacked, but what may be the cause of this disintegrated state I cannot say.

Many animals attacked with pleuro-pneumonia epizootica recover, that is to say, the lung or part of the lung that has become hepatized gets enclosed in a newly-formed membranous sac when the communicating powers of the disease cease, but often a suppurative cyst forms in the centre of the hepatized part, and, gradually spreading until it comes in contact with healthy tissue, pleuro-pneumonia epizootica starts anew. Or before this time some external cause may start the disease anew, and in both cases it resumes its powers of communication from one animal to another. The dormant period then is that between the cessation of the first attack and the commencement of the second.

Looking at the spreading properties of pleuro-pneumonia epizootica, nearly all who have scientifically studied the malady agree in this, that it spreads from one animal to another by ways and means not clearly understood.

But even if we take a glance at those we do know, it will teach us the amount of care needed to arrest its progress.

We know a contagious disease needs touch; an infectious disease needs but be breathed; and he must either be a bold or an ignorant man who would stand up and assert that pleuro-pneumonia epizootica cannot avail itself of both these channels.

It matters little how the virus is communicated, whether by the food, the drink, the air, the skin of another animal, or the clothes or hands of a man. It matters not how you bring the virus. It may fall on the grass and be dried up by the burning sun. Whatever disturbs that grass sends the poisonous particles afloat on the wings of the wind, to be breathed or licked by some unfortunate beast.

And we can go further, and speak of a healthy member of a diseased family communicating the malady; and why not, if the virus should fall on its skin? And if, as is sometimes the case, that animal's constitution resists the attack, may it not be breathed or licked from its hide. Instances of disease being thus communicated are not wanting in human pathology, especially in the case of measles and smallpox.

It matters little though the virus be imperceptible to the naked eye. The inoculating matter is so on the point of the surgeon's lancet.

We know, too, that inoculation will produce pleuro-pneumonia epizootica without even a scratch. The superficial absorbents take it up most keenly, though it would be difficult, without actual experiment, to say with certainty at what stage of the disease it is communicable.

CAUSES.

1st. Primary.
2nd. Predisposing.
3rd. Exciting.

1st. Primary causes are those which first operate on the production of a new disorder. Of course, pleuro-pneumonia epizootica must have been at first produced, assuming what may be termed spontaneous production.

Now, we know that there are some men standing high in scientific circles, who argue that because it was first so introduced, it must of necessity be so produced again in every individual case; but there are too many *dead* facts against this theory.

For my own part, I cannot entertain the notion, as everything seems dead against it.

What may have been the primary cause or causes of pleuro-pneumonia epizootica, I do not know, but this I do know, that the exposing of healthy cattle to the virus from diseased animals, in such a way that it becomes absorbed, is now the primary cause of production.

2ndly. Predisposing causes are those which arise out of a peculiar state of the constitution, made so by the inheritance of parental weakness, or from long-continued ill-treatment.

The communication of parental points depends much on the temperament of each parent. If the temperament be nearly balanced, the offspring will partake equally of each; but if there be a preponderance on one side, the offspring will take most from the parent with the stronger temperament.

Hence, should there be a chest weakness in anyone, that one will communicate the weakness or tendency to disease if he or she possess the stronger temperament.

Many of the fœtus found in the wombs of diseased cattle had also the disease.

3rdly. Exciting causes are such as exist in the speedy development of the disease, such as cold damp air, hot burning winds, filthy yards, or sheds, hard work, and hard unnatural treatment of any kind. In fact, the subjecting an animal to any new course of treatment, diverting or forcing it from its wonted habits, may act as strong exciting causes.

The most common exciting causes in this country will be drafting, tailing, and driving the cattle long journeys.

SYMPTOMS.

The external symptoms common to this disease will not be easily detected among bush cattle, first, because their great constitutional strength (as compared with animals more under domestication) prevents the disease at first from making a decided stroke; and even though it does, the animal never suffers nor shows the same amount of pain.

Their habits of life, too, are such that immediately on the approach of man a degree of alarm takes hold of them; and then all symptoms are shrouded, unless of a most aggravated nature.

Still a practised eye will soon see—if the coat stares and appears drier than usual—if the animal appear crouched up when standing, or cramped when walking or running; if he be in this state, the eye will appear swollen, and watery effusion flowing from inner canthus; nose dry, inferior opening wider than usual, and a thin, watery discharge running from it. The disease has just commenced in the lungs.

After the malady has proceeded into the second stage, the discharge from nostril is white and thick, sticking in patches about it.

In the third stage you have, in addition, a short grunt of a cough, and all the above-mentioned symptoms accelerated.

POST-MORTEM APPEARANCES.

I have opened, and seen opened, some hundreds of diseased cattle, in all stages of pleuro-pneumonia epizootica. Of course I had no means of determining exactly the length of time the animals had been ailing.

That which seemed to be the earliest organic destruction of lung consisted of a white, dry, distended, cellular stage. The red corpuscles evidently do not now enter the capillaries for the purpose of being aërated, though the coloured blood may be seen in all the large vessels.

In this stage I believe the air-cells to be filled with a kind of steam. They will not collapse, even though pressed from without, or else the muscular tissue has gone into a spasmodic state.

However, I found in other parts of the lung watery effusion, which I regarded as this steam condensed—a state of lung which led a professor of pathology to set down the disease as one of a dropsical nature.

I have also in the same lung observed congestive stage of pleuro-pneumonia epizootica, differing from common congestion in this, that you cannot press out the blood from the part, and it seems as if turned into muscle.

Taking this in connection with the pale state, one would almost be led to suppose that it was not the want of iron nor of the red corpuscles carrying that iron, but rather its excessive effusion in some places and non-effusion in others from local or general causes.

In the second stage the congestion has gone nearly over the whole of the lungs, and the fleshy spots increased in size and number, while the cells appear filled with dark, carbonaceous blood and areolar tissue filled with lymphy effusion.

If the congestion be more superficial than deep-seated, the lung appears all mottled outside, and you have extensive pleuritic disease with effusion of lymph; and the blood drawn from the animal appears very black in colour, with a milky-looking substance floating on its top.

I am inclined to believe that this dark-spotted congestive state is caused to a great extent by the improper mode in which the blood has been aërated.

But how to account for the milky matter on the top of the blood I do not know. I have before stated my opinion on that subject.

The third stage is the marble or hepatized stage. The absorbents have been busy at work, clearing out the dark blood from the cells, while lymph has been effused in greater quantity in the areolar tissue.

But in the cells a deposit remains, and that deposit seems principally made up of the fibrinous portion of the blood. The capillaries ramifying between rings of trachea are congested in this stage, and much irritation exists round the vocal cords, and in the region of glottal opening. All this time the adhesive process has been making rapid progress, so that now, when hepatization is complete, the lung has generally become firmly attached to the ribs.

If the animal survives all this, the lymphy effusion continues, and a new membrane is formed around the diseased lung. This continues until the envelope is complete, and then this disease ceases. But another commences, termed the suppurative process. This I have explained in another part of my paper.

In all the animals I opened bad with pleuro-pneumonia epizootica I found all the other organs remarkably healthy, except the lungs and pleura, except the first case given in my first report.

For this reason I am inclined to think the per-centage of deaths among the present generation will not be great.

In the post-mortem appearance of cattle in this country there are many remarkable differences, compared with the cattle of Great Britain. You have there, accompanying this disease, great effusion of water into the chest, and you have great stench in the last stages; you have also great derangement of digestive organs.

Seeing these appearances are not common among the cattle of the southern portion of the colony, and seeing the various tissues of their body so healthy and so strong, we may safely assert that the per-centage of deaths will not be nearly so great here as in Great Britain.

RECOMMENDATIONS.

1st. All cattle imported by sea or land to be examined by a duly qualified person.
2nd. Destroy all animals bad with pleuro-pneumonia epizootica.
3rd. Stop all bullock teams from travelling beyond their own lands—horses to be employed instead.
4th. Erect boiling-down establishments; boil down rather than travel a herd to market known to be diseased. The virus is destroyed by boiling.
5th. Shift cattle as little as possible.
6th. Inoculate all cattle while young.
7th. Do not breed from cattle now diseased or recovered from disease.
8th. Burn all grass where diseased cattle have been pasturing.
9th. No diseased cattle to be sold out of the pound.

As the disease is now in many herds, and as in all likelihood inoculation will be practised as the great preventive, we may expect a per-centage of losses, it will become an important question what mode of treatment can with ease, safety, and success be adopted, so as better to enable the animal suffering, whether from inoculation or otherwise, to withstand the fatal risk it runs. I would suggest that all owners of cattle use the following, where practicable:

1 bushel of corn or oats, crushed
1 lb. salt
½ lb. sulphate of iron, well powdered
} mixed.

This will assist in the assimilation of the elementary parts of the blood, adding at the same time tone and vigour to the system.

It will also be necessary to secure for the cattle clear, cold water. Such water will be relished under such a mode of treatment, and it will add much more oxygen to the system than hot, dirty water would.

Many of the runs I have passed through possessed good springs; a very little trouble spent in digging a hole would have secured for the herd the best water, and always plenty of it.

Were my professional services required for the special treatment of valuable or imported stock, I should, of course, follow the best mode now practised by the profession. It would not do for me to specify that here, as the proper application of it requires the advice and care of a veterinary surgeon.

EXPERIMENTS.

A series of experiments might be instituted for the purpose of ascertaining the degree of time that elapses between the period of incubation and the exhibition of internal symptoms.

Also to ascertain at what period of the disease its contagious and infectious nature can act.

Also to ascertain under what conditions the virus loses its power.

Also, whether it would be better to expose young cattle to diseased ones, or to inoculate.

Also, to test whether inoculation will cure or prevent, or do both.

Also, to see whether the catching virus is confined solely to the lungs, or is general to other excretory organs and blood.

GENERAL REMARKS.

Looking over my reports it will be observed that many diseases exist here besides pleuro-pneumonia epizootica. During my visits I have attempted to explain the difference between these and pleuro-pneumonia epizootica, for the benefit of cattle owners.

I have often been asked—Is the flesh of animals labouring under pneumonia epizootica poisonous to the human subject? I say no. But yet it cannot be good for human food, especially if the disorder has reached its second and third stages. In fact, it must become highly dyspeptic.

I have the honour to be, sir,
Your most obedient servant,
JOHN POTTIE, *Veterinary Surgeon.*

Translations and Reviews of Continental Veterinary Journals.

By W. ERNES, M.R.C.V.S., London.

Annales de Médecine Vétérinaires, April, 1862.

ETIOLOGY OF EXUDATIVE PLEURO-PNEUMONIA.

By M. LECONTURIER, Médecin Vétérinaire, &c.

AT the end of the year 1859 the author, in a report sent to the Governor of the province of Brabant, raised a question relative to pleuro-pneumonia, the solution of which he thinks gives origin to a well-founded hypothesis, which has been admitted by M. Verheyen, President of the Provincial Agricultural Society and Professor of the Veterinary School at Brussels. In giving an account of it in the report published in the *Annales* for 1859, the Commission of the Provincial Agricultural Society has given a very incomplete and confused idea of the author's views. This has determined him to reproduce his opinions, as he thinks they are worthy of being submitted to the consideration of veterinary practitioners. Exudative pleuro-pneumonia has been known in Belgium since 1827. The effects of its nosogenic causes and mysterious spreading are, however, new. The question is, what can have been the cause of the bovine species being so sus-

ceptible of this disease? Is there any other cause than the amelioration which has taken place in the breed? Or if not, it is evident that the cause must be looked for elsewhere. The author is of opinion that pleuro-pneumonia is partly the result of the improvements in agriculture and the establishing of large distilleries. In the latter, the system of feeding renders the first three stomachs of the animal comparatively useless, the fourth only receiving food, which is nearly liquid. For this sort of diet teeth or salivary glands would not be required. The liquid alimentary mass passes at once into the digestive or fourth stomach. The organization of the ox indicates that his food ought to be solid. That vast reservoir, the rumen, is intended to receive the grasses which the animal hastily crops. If this viscus is rendered useless, it must necessarily follow that the two others likewise become so to some extent. The abdomen consequently decreases in size, and fluid fæces are evacuated, and it is only after a time that the animals lay on flesh. The great object of feeders being to fatten the animals in the shortest possible time, they force them with abundance of the refuse of the distillery, and they thus receive an excess of an aliment which is contrary to their nature. This liquid mass, arriving in the intestines, is speedily absorbed and assimilated. Great activity is thereby brought about in the organs of respiration, circulation, &c. To counteract these baneful effects, frequent cleansing of the skin with the curry-comb and brush, and also a good supply of fresh air, are required; but as these means would prevent the speedy fattening, therefore the contrary practice is adopted. The animals are seldom dressed, the air which circulates in their close, confined stables is hot and damp, the object of the feeders being to concentrate the flesh and fat to the interior. The animals soon begin to increase in size, and then is heard an occasional husky cough. In some of them the respiration becomes short, and the existence of pleuro-pneumonia is no longer to be doubted. Nature, in her efforts to form flesh and fat, has been unable to convert the whole of the liquid food into these products. The excess of matter absorbed, which the skin, impeded in its action, and also the kidneys and the lungs, have been unable to eliminate, must accumulate somewhere. It is therefore not surprising that a considerable exudation should be produced in the lungs.

Professor Gluge, of the University of Brussels, was the first who expressed an opinion that the exudation in the interlobulary tissue existed before the inflammation of the lobules. From which it results that the inflammation of the paren-

chyma of the lungs is consecutive to the interlobular exudation. This would in some way account for the formidable nature of the malady, and the reason that it does not yield to antiphlogistic treatment equally with simple pneumonia. The exudation is favoured by the greater freedom possessed by the lungs, consequent upon the increased capacity of the chest; the collapsed rumen no longer maintaining the diaphragm in its proper position. For the last few years a decrease has been observed in the number of cases in the distilleries. This the author attributes to the introduction of mangel-wurzel as an article of diet. This root, besides containing different elements of nutrition, requires the concurrence of the whole digestive apparatus to convert it into nutriment. In the case of beasts which are fattened in the rich pastures of Holland and elsewhere, the cause, in the opinion of the author, is similar. The tender plants which are taken in large quantities, in almost a pulpy state, relax the system, and thus predispose to the invasion of the malady, which makes its appearance just when the animals begin to acquire flesh.

The variations of the temperature have also great influence, by producing more or less sudden modifications in the function of the skin. A cold, damp air is always hurtful to cattle in the field or pasture.

The author endeavours to establish that pleuro-pneumonia is the immediate result of causes which are the work of man, not of nature. If this is founded on truth, those animals which are placed in the opposite circumstances ought to escape. This is just what takes place; to wit, the arid plains, mountainous countries, and all districts where rich pastures are wanting and distilleries rare, there pleuro-pneumonia is almost unknown. This, at least, is the result of observations made in Belgium, and no doubt the same holds good in other countries. The question might be asked, how is it that in the same locality one cultivator's stock is decimated, while that of another escapes? To account for this fact, the condition of the animals must be considered when they are put into the pasture, as well as their age, breed, and conformation. If milch cows, whether they are in full milk or in a state of gestation, all of which conditions are for or against the malady. As to the age, young and growing animals are less subject than adults; for this reason, that the excess of nutriment goes to the growth. Great importance is to be attached to conformation. An animal which is well ribbed, has a broad back and capacious chest, with well-developed frame, will resist an attack of pleuro-

pneumonia much better than one which has the opposite conformation. In the first the products of excess of nutrition will find ample space for deposition. It is well known that on most farms the stock in winter is very lean. It is in the month of March that those destined for the butcher are sold for the purpose of being fattened, and for this intent they are put into the best pastures. It is also to be remembered that, while in a state of emaciation, the animals are exposed to a sudden change from innutritious to highly stimulating food, which predisposes them to exudations into the lungs, more particularly when they are allowed to feed at discretion. If farmers were more careful in feeding their cattle during the winter, and preventing the sudden transition from a sparing to an abundant diet, they would be far less exposed to the ravages of pleuro-pneumonia. Milch cows, when in full milk, are more exempt, as the secretion of milk carries off the excess of nutritive matter, which under different circumstances would be eliminated by pulmonary exudations. This shows how difficult is the study of the etiology of pleuro-pneumonia.

The author has not the pretension to think that his ideas are without objection, as he is well aware that pleuro-pneumonia has made its appearance under all conditions of feeding and management, but these exceptions have been but few, and it has been observed that in them the exudation is very slow. It is also in these cases that a cure is more easily effected, and under these circumstances it is that the malady assumes its sporadic form. It is very rare that during winter the stock of the farm is attacked; that is, if on short allowance. If, however, the affection does make its appearance, it ought to be ascribed to other morbific causes, such as the sudden suppression of the functions of the skin or some other analogous occurrence.

In the foregoing views contagion has not been mentioned, but it is far from the author's intention to deny this mode of the transmission of pleuro-pneumonia. Such would be opposing the unanimous opinion of the most learned men in the veterinary profession. The author, nevertheless, maintains, without fear of contradiction, that this malady is mostly spontaneous, but becomes transmissible, as has been proved by undeniable facts. Nevertheless, this propagating power is often very weak, for in some sheds, containing fifteen or twenty head of cattle, one or two only take the disease, although not the slightest precaution is adopted to prevent its propagation. Many times the author has witnessed these facts, and on this subject he does not find much con-

sistence among those pathologists who, after having proclaimed the contagiousness of pleuro-pneumonia, afterwards declare that this malady spares the greatest number of the animals in an invaded shed. This question presents many difficulties. The author, without entering into any further details, thinks that this malady is either contagious or not, according to the circumstances, more or less favorable to its development, under which the animals are placed. The important question of the contagion of pleuro-pneumonia has been the object of many researches, and continues to occupy in every country the minds of men of science. Veterinary surgeons, whose object has been principally to combat the malady, have recommended certain remedies which appear to them efficacious, but which, when employed by others, have proved to be unavailing. Hence the discredit into which these remedies have fallen, after having been considered almost as specifics. Others have occupied themselves with prophylactics. Dr. Willems, after having tried experiments on his father's stock, announced to the world that cattle could be preserved from pleuro-pneumonia by inoculation with the liquor expressed from the diseased lungs of those which had died or been sacrificed. This system has been experimented on in divers other countries as well as in Belgium, where experiments are still being carried on, which, it is to be hoped, will lead to a correct solution of the question. If the commission established in the communes of East Flanders, where pleuro-pneumonia reigns, should show that the animals after inoculation resist the epizootic in this hotbed of the disease, there would be no longer any doubt as to the efficacy of this preservative of Dr. Willems. It would then only be necessary to determine how long the preservative power of inoculation would last, and whether the effect is different from other means of prevention, such as the use of a seton, rendered very active by the bichloride of mercury, the root of the black hellebore, &c.

As before stated, the result of the modifications introduced into the system of feeding, not only on well-managed farms, but also in distilleries where they have ceased to feed their fattening stock *exclusively* on the refuse matters, substituting in part good meadow hay, clover, and mangold-wurtzel, is most satisfactory.

It is also to be remarked, that the longer the malady prevails in a district the less will be the number of individuals attacked. The weaker, and those which are predisposed, first fall a sacrifice; consequently those which remain, being of a stronger constitution, procreate more healthy individuals, which are better able to resist the disease.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The Annual Meeting of the Society was held on the 22nd ult., when the following report of the Council was read:

"Since the last general meeting in December, the Council have had to deplore the loss of their President, His Royal Highness the Prince Consort; and, in order to mark their sense of this calamity, they thought it right to present, through the Secretary of State for the Home Department, an address of condolence to Her Majesty the Queen, who has been graciously pleased to accept the same, and to present the Society with a portrait of His Royal Highness, for which the humble and grateful acknowledgments of the Council have been tendered through the President.

"The Council have thought it a fitting mark of respect to the memory of their late President to contribute the sum of £100 towards the National Memorial Fund, now in collection, in testimony of the invaluable services rendered by His Royal Highness to the cause of agriculture.

"The place named in the last half-yearly report as fixed for the country meeting, to be held in accordance with the provisions of the Royal Charter, has been changed from Windsor to Richmond, in Surrey, and will be held on Saturday, 5th July, at 12th o'clock.

"During the past five months 3 governors and 54 members have died, and the names of 102 members have been removed from the list by retirement, or otherwise, while 4 governors and 259 members have been elected, so that the Society now consists of—

83 Life governors.
97 Annual „
1151 Life members.
3475 Annual „
17 Honorary „

Making a total of 4823, being an increase of 104 names on the list.

"The Council have elected the Right Hon. Lord Portman President of the Society; Mr. Fisher Hobbs a Vice-President, in the room of the late Earl of Yarborough; and the Right Hon. the Earl of Stradbroke a Member of Council, in the room of the Earl of Powis, elected a Trustee.

"The half-yearly statement of accounts, to the 31st December, 1861, has been examined and approved by the auditors and accountants of the Society. The funded capital

stands at £17,488 17*s.* 10*d.* stock, in the New 3 per Cents.; and the current cash balance in the hands of the bankers on the 1st inst. was £4298 19*s.*

"Papers have been read, at the weekly meetings, of much interest to the agricultural community—first, on 'The Agriculture of Russia,' communicated by the Imperial Society of Agriculture of Moscow; second, on 'Cattle Condiments,' by Mr. Beale Browne; third, on 'Steam-boiler Explosions,' by Mr. Holland, M.P.; fourth, on 'The Growth of Mangold-wurtzel;' fifth, on 'Preparing, Mixing, and Cooking Food for Cattle,' by Mr. Frere; and sixth, on 'The Present State of Agriculture in Algeria,' by Mr. Caird, M.P. A lecture has been delivered by Professor Voelcker on 'Milk.'

"The dissemination of the information thus given, by means of the public press, has been attended with much benefit.

"Professor Simonds' report on 'Rot in Sheep' has been published in the form of a pamphlet, and may now be purchased of Mr. Murray. It will be inserted in the next number of the journal.

"The space applied for by the exhibitors of implements having much exceeded the area allotted to that department, it has been found necessary to exclude many articles which have of late years been exhibited in the Society's show-yard, but which had no immediate connection with the purposes of agriculture.

"The number of stock entered for competition in almost every class in which prizes have been offered leads the Council to anticipate a very important show.

"It has been determined to erect strong weather-proof horse-boxes, for all the entire horses, in a distinct portion of the yard, where, at stated periods, they will be let out for exhibition.

"The arrangements for giving the metropolitan meeting an international character have been much advanced by the assistance received from Her Majesty's Secretary of State for Foreign Affairs, in communicating with the Ministers of Agriculture in foreign countries; and the Council cannot do less than recognise in this public manner his Lordship's cordial co-operation with the objects of the Society.

"In compliance with the very generally expressed wish of the members, the Council have directed a programme of the arrangements connected with the meeting at Battersea Park to be forwarded to every member of the Society, who will thus be duly informed of the subjects of interest during the show.

"The collection of wool exhibited by the Society in Class

IV in the International Exhibition will be found to contain specimen fleeces of nearly all the breeds of sheep and their crosses in the United Kingdom, while the various uses to which they are applied by the manufacturer are exemplified in smaller cases. The Council have to thank numerous contributors for the liberal support and assistance received in making this collection.

"The Council have decided, subject to the usual conditions, to hold the Society's country meeting next year at Worcester.

"By order of the Council,

"H. HALL DARE, *Secretary.*"

METROPOLITAN MEETING.

PROGRAMME.

GOVERNORS and members of the Society, who have paid their subscriptions for *the current year*, will be admitted to the show-yards, during the time they are open to the public, without payment, by tickets issued by the Secretary, which tickets shall not be transferable; and any governor or member who shall be found to transfer or lend his ticket shall be reported to the Council, and shall in future forfeit the privileges of membership.

Application for the governors' and members' tickets must be made at 12, Hanover Square, either by post or personally, not later than Saturday, the 21st June, and afterwards at the Secretary's Office, near the entrance to the show-yard.

Members of the Highland and Agricultural Society of Scotland will be admitted on the same terms as members of this Society.

Monday, June 23rd, Tuesday, 24th, Wednesday, 25th.—The Implement-yard open from eight o'clock in the morning till eight in the evening, at an admission-charge of 2*s.* 6*d.* for each person.

Wednesday, 25th.—Cattle-yard open from eight in the morning, at which hour the judges will commence inspecting the live stock, and making their awards.

Admission: members, free; non-members, one sovereign.

Persons entering the cattle-yard from the implement-yard will be admitted at 17*s.* 6*d.*

The show-yards will be closed at eight in the evening.

Thursday, 26th.—The general show of cattle, horses, sheep, pigs, and implements, open to the public from eight o'clock

in the morning till eight in the evening. Admission, 5*s.* each person.

Friday, 27th, Saturday, 28th.—The general show of cattle, horses, sheep, pigs, and implements, open to the public from eight o'clock in the morning till eight in the evening. Admission, 2*s.* 6*d.* each person.

Monday, 30th, Tuesday, July 1st.—The general show open to the public from eight o'clock in the morning till eight in the evening. Admission, 1s. each person.

Wednesday, 2nd.—The general show open to the public from eight o'clock in the morning till six in the evening, at which hour it will finally close. Admission, 1*s.* each person.

Saturday, 5th.—General meeting of the members at the "Star and Garter" Hotel, Richmond, Surrey, at twelve o'clock.

Thursday, June 26th, Friday, 27th, Saturday, 28th.—Public exhibition of steam cultivators at work, from 11 a.m. to 4 p.m., near Farningham Station, in Kent, a distance of twenty-four miles from the Victoria Terminus of the London, Chatham, and Dover Railway.

President.—The Right Honorable LORD PORTMAN.

Stewards of Departments.

Live stock.—Hon. W. CAVENDISH, M.P.; Mr. PAIN; and Mr. MILWARD.

Foreign stock.—Mr. FISHER HOBBS.

Implements.—Lord LEIGH; Hon. A. VERNON; Mr. TORR; and Mr. WREN HOSKYNS.

(*Steward elect*—Sir E. KERRISON, Bart., M.P.)

Finance and show-yard receipts.—Hon. Colonel A. NELSON HOOD; Mr. BARNETT; Hon. A. VERNON; Mr. W. FISHER HOBBS; Mr. C. WREN HOSKYNS; Mr. MILWARD; Mr. TORR; Mr. HENRY WILSON; Mr. BRAMSTON, M.P.; Mr. CANTRELL; Mr. DRUCE; and Mr. POPE.

Stewards of refreshments.—Mr. BARNETT and Mr. WELLS.

General arrangement of show—Mr. BRANDRETH GIBBS.

By Order of the Council.

H. HALL DARE, Secretary.

12, HANOVER SQUARE,
LONDON, W.; *May*, 1862.

By the Regulations of the Society—

All persons admitted into the show yard, or other places in the temporary occupation of the Society, during the meeting, shall be subject to the rules, orders, and regulations of the Council.

ROYAL COLLEGE OF VETERINARY SURGEONS.

NEW MEMBERS OF THE PROFESSION.

At the several meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, which have just been held, the following gentlemen passed their examination and were admitted members of the body corporate.

STUDENTS OF THE ROYAL VETERINARY COLLEGE, LONDON.

April 28th.

Mr. Alfred Brooke Proctor.	Meridan, Warwick.
— Geo. King Wake . .	East Dereham.
— Rob. Chambers Cleveland,	Wangford, Suffolk.
— Wm. Ward	Crediton.
— Chas. North	Spilsby.
— Wm. H. Llewellyn. .	Liverpool.
— Thos. Burrell. . . .	London.
— Andrew Ganley . . .	Dublin.
— Henry Stanley . . .	London.
— Alex. Loonie Gibson .	Manchester.
— Arthur Gaskin . . .	London.
— Wm. Wiggins . . .	London.

April 29th.

Mr. Rowland Tayler. . .	Colchester.
— Wm. Albert Russell .	Princes Risborough, Bucks.
— Henry Hunter . . .	Newcastle-on-Tyne.
— James Bibby . . .	Audley, Newcastle-under-Lyne.
— Fred. Thomas Stanley.	Leamington.
— Rich. Sam. Reynolds .	Mansfield.
— Henry John Goodall .	Croxton Park, Leicester.
— John Oliphant . . .	Woolwich.
— Wm. Carless . . .	Stafford.
— John Fairbairn . . .	Alnwick.

April 30th.

Mr. Jas. Crowhurst . . .	Warbleton, Sussex.
— Joseph Thos. Thompson,	Braithwell, Rotherham.
— Henry Paradise . . .	Dursley.
— Fred. Rich. Ingersoll .	Lewisham.

Mr. Rich. Grainger Verney.	Stow-on-the-Wold.
— Jas. Leggett	Chersfield, Suffolk.
— Thos. Peter Boughton .	Hounslow.
— David Arthur . . .	Newmarket-on-Fergus, County Clare.
— Wm. Meadows Ansell .	Eastbourne, Sussex.

May 2nd.

Mr. Jas. Allen	London.
— Wm. Murch	London.
— Walter Jas. Beart . .	Rainham, Norfolk.
— Francis Walker . . .	King's Lynn.
— Edw. Stanley . . .	Birmingham.

STUDENTS OF THE EDINBURGH VETERINARY COLLEGE.

Mr. John Henry Boyce .	Addingfleet, Yorkshire.
— Alfred Thomas Brett	Hertfordshire.
— John Donaldson . .	Paisley.
— Andrew Dunlop . . .	Glasgow.
— John H. Ferguson . .	Glasgow.
— William Fields . . .	Seconfield, Yorkshire.
— John Hay	Lauder, Berwickshire.
— Michael Healy . . .	Clare Castle, Ireland.
— John Lawson . . .	Manchester.
— Joseph Leather . . .	Eccles, Manchester.
— Andrew Johnston Macintosh	Preston House, Dumfriesshire.
— James Murphy . . .	Mountpellier Hill, Dublin.
— David Pollock . . .	Bellshill, Glasgow.
— Thomas Roberts . .	Chirk, Shropshire.
— Adam C. Robertson .	Airdrie, Lanarkshire.
— George Sermon . . .	Manchester.
— Richard West . . .	Thetford, Norfolk.
— William Gregory Willett	Great Budford, Cheshire.

STUDENTS OF THE EDINBURGH NEW VETERINARY COLLEGE.

Mr. William Dearlove . .	Kirkby-Overblow, Yorkshire.
— George Hain	Denhead, Fifeshire.
— Joseph Walter Horton.	Wednesbury, Staffordshire.
— John Hughes . . .	County Armagh.

Mr. Joseph Huthart . . .	Cumberland.
— William Mackie . . .	Aberlour, Banffshire.
— George Matthewson .	Selkirkshire.
— Alexander James Murray	Edinburgh.
— Charles Percival. . .	Richmond, Surrey.
— Robert Scott	Edinburgh.
— David Smith . . .	Forteviot, Perthshire.
— George Smith . . .	Blairgowrie, Perthshire.
— John Boardman Taylor	Ringley Bridge, Manchester.

Veterinary Jurisprudence.

ADMINISTRATION OF ARSENIC TO HORSES BY A FARM-SERVANT.

Robert Foker, farm-servant, in the employ of Mr. Hornby, farmer, of Driffield Wold, was charged, on the information of his master, with having, on April 9th, administered arsenic to the horses under his charge, thereby causing the death of two of them.—Prosecutor gave evidence with respect to his loss, and was followed by Mr. Bowman, veterinary surgeon, who attended the animals, who stated that the cause of their deaths was attributable to poison having been administered to them.

Mr. F. C. Matthews, jun., of Driffield, said that on the 10th of April, he received the stomach of one of the animals, and on analysing its contents he discovered several grains of arsenic; on the following day he received the contents of the stomach of another animal, and also detected arsenic. He received from Mr. Young a parcel containing oats, and on analysing them he discovered arsenic.

Richard Scaife, apprentice to Mr. Elgey, druggist, said that on Monday, the 7th inst., prisoner called at their shop and asked for a pound of arsenic; he asked him what it was for, when he replied that he wanted to poison rats. He sold it to him, and he signed a cross in the arsenic book. There was another servant-man who followed him into the shop, and saw him make his mark. He gave the information to prosecutor's brother.

Robert Crozier, waggoner, in the service of Mr. Hornby, said that he was in the company of the prisoner when he purchased the arsenic; he went into the shop first, and took in an oil-bottle. Prisoner followed him, and got two half-pounds of mercury to give to the horses. Witness took one parcel and prisoner the other, who told him he should give some to the horses when the foreman went home. The prisoner advised him to get some mercury and give to his horses, as it would "lig" the flesh on. He asked him how much he was to give them, when prisoner replied a teaspoonful for each horse at a time. He did not give any to the horses, but he took it home and put in the bin, and on the Wednesday morning he took it to prisoner's stable, and put it in his bin. He told prisoner as they was going home that he should not give any to his horses, for it would be poisoning them.

Supt. Young said that on the 10th inst. the prisoner was given into

his custody on the above charge. On the 11th inst., he proceeded to the house of Mr. Hornby, and went into the stable, and in the corn-bin, which was pointed out to him as being under the prisoner's care, he found a brown-paper parcel, marked "Poison." He then examined the manger, and found a quantity of chopped straw, mixed with bran and corn. He swept it up, and delivered it over to Mr. Matthews.

The prisoner said nothing in reply to the charge.

The magistrates retired for consultation, and on their return said that in considering the case they could not think that the prisoner gave the arsenic to the horses with intent to poison them, and therefore they would deal more leniently with him than as if there had been any intention or malice proved; but still it was a case which called for a severe punishment, and they should sentence him to three months' imprisonment with hard labour.—*Driffield Times.*

CLERKENWELL POLICE COURT.

CONVICTION FOR EXPOSING A DISEASED COW FOR SALE.—THE CAUSE OF ILLNESS IN THE METROPOLIS.

Thomas Camp, an extensive cowkeeper and dealer in cows, carrying on business in Argyll Street, St. Pancras, was charged before Mr. Barker with unlawfully exposing for sale, in the Metropolitan Cattle Market, a certain cow, which said cow was then and there diseased, and unfit for human food.

Mr. Stuckberry, from the office of the City Solicitor, attended to prosecute, and Mr. Beard defended.

Mr. Love, of the Royal Society for the Prevention of Cruelty to Animals, was in attendance.

Mr. Stuckberry, in opening the case, said these proceedings were instituted under the 17th section of the 20th and 21st of Victoria, cap. 135 (The Metropolitan Market Act, 1857), which gave the clerk or the inspector of the market power to seize any cattle or meat exposed or offered for sale which might appear unfit for human food, and the person guilty of every such offence is liable to a penalty not exceeding £20. In this case, which was a very bad one, the cow was suffering from pleuro-pneumonia, as well as the mouth and foot disease. These diseases are contagious, and have made their appearance in all parts of the globe, destroying a large number of animals. That the flesh of the animals so affected was kept for food, there could be no dispute. He should ask for a conviction, and he might state that it was the intention of the Corporation to prosecute in every case that was brought under their notice.

Mr. George Thatcher said—I am inspector of the Metropolitan Cattle Market. The defendant is a buyer and seller of cows, and keeps a large dairy. He had a cow in one of the alleys, with a halter round its head. In consequence of what a boy told me, I had some conversation with the defendant, and he told me the cow belonged to him, and that he had brought it there for sale. He also said that there was nothing the matter with the cow—that it had only gone off its milk, and that he intended to sell it for grazing. The cow was in a very diseased state—it could hardly breathe—the steam was coming through its hide, and it was also suffering from the mouth and foot disease. The cow was in so bad a state that it could not move any further. When the

cow was opened, the lungs were in a most dreadful state. It was quite unfit for human food.

Mr. Tegg, veterinary surgeon to the market, said—I inspected the cow in question, and found it in a dreadfully diseased state. It was in a very emaciated conditions, and was suffering from pleuro-pneumonia. I do not consider that disease contagious. It also had the mouth and foot disease, which I do not consider contagious. I saw the cow opened, and the lungs were dreadfully diseased. The udder was full of matter. It was quite unfit for human food.

Mr. Beard addressed the magistrate in mitigation, and contended that the smallest possible fine would meet the justice of the case, as his client had only a few weeks ago given £12 for the cow, and had sent it to the market, not knowing that anything was the matter with it.

A witness was called who took the cow to market, and said he was not aware that it was diseased.

Mr. William Staveley, veterinary surgeon, of Highbury, said that pleuro-pneumonia and the mouth and foot disease were not contagious. He had tried it by inoculation, and was certain that it was not.

Mr. Barker.—Do you consider that a cow in the state of disease you have described would be fit for human food?

Mr. Staveley.—Well, I should not like to eat any of it, although I have no doubt that as bad is made up in respectable shops and largely partaken of.

A voice.—Then I will have no more sausages (loud laughter).

Mr. Barker said he had no doubt about the cow being unfit for human food. As this was the first case of the kind that had been brought under his notice, he should only inflict a penalty of £5 and costs.

The fine was paid.—*Evening Standard*, May 8th.

CENTRAL CRIMINAL COURT, May 12th.

HORSE-CHAUNTING.

William Cook, 62, a well-dressed man, was charged with unlawfully obtaining £115 10*s.*, by means of false pretences.

Mr. Sleigh and Mr. Orridge prosecuted; Mr. Giffard was counsel for the defendant.

The offence imputed to the defendant was that which is pretty well understood by the term "horse-chaunting." The prosecutor was a gentleman named Joynson, residing at Foots Cray, and in March last he saw an advertisement of two dapple-gray carriage-horses for sale. He sent his coachman to look at them, and the prisoner represented himself to be a gentleman of property at Leamington, and to be the owner of them, and also that they had been driven by his wife and daughter; but that in consequence of his family being in bad health he was obliged to give up the horses in question. Upon the faith of these representations the prosecutor was induced to give £115 10*s.* for the horses, and his coachman was sent to fetch them home, but he had only gone a very short distance when he discovered that they were both broken-winded and comparatively worthless. Upon an application being made at the stables the next morning they were found to be locked up, and the prisoner had decamped, and the next that was heard of him was his making an application to the Court of Bankruptcy. Evidence was given that he had for a long time been engaged in transactions of

this description, and that he was known as "Old Tom," and that he also passed as the Rev. Mr. Clerk.

The jury found the prisoner guilty, but recommended him to mercy on account of his age.

He was sentenced to nine months' imprisonment and hard labour.

ARMY APPOINTMENTS.

VETERINARY DEPARTMENT.

A. G. Ross, gent., to be Acting Veterinary Surgeon.—*Gazette*, May 17th.

MISCELLANEA.

LAMARCK.

The famous naturalist Lamarck possessed a greater acquaintance with the lower forms of life than any man of his day, Cuvier not excepted, and was a good botanist to boot. Two facts appear to have strongly affected the course of thought of this remarkable man—the one, that finer or stronger links of affinity connect all living beings with one another, and that thus the highest creature grades by multitudinous steps into the lowest; the other, that an organ may be developed in particular directions by exerting itself in particular ways, and that modifications once induced may be transmitted and become hereditary. Putting these facts together, Lamarck endeavoured to account for the first by the operation of the second. Place an animal in new circumstances, says he, and its needs will be altered; the new needs will create new desires, and the attempt to gratify such desires will result in an appropriate modification of the organs exerted. Make a man a blacksmith, and his brachial muscles will develop in accordance with the demands made upon them; and in like manner, says Lamarck, "the efforts of some short-necked bird to catch fish without wetting himself have, with time and perseverance, given rise to all our herons and long-necked waders." The Lamarckian hypothesis has long since been justly condemned, and it is the established practice for every tyro to raise his heel against the carcass of the dead lion. But it is rarely either wise or instructive to treat even the errors of a really great man with mere ridicule, and in the present case the logical form of the doctrine stands on a very different footing from its substance.

WONDERFUL INSTINCT OF WILD ANIMALS.

Various interesting facts have been noted in relation to the demeanour of animals prior to a great convulsion. It was toward noon, beneath a clear and almost cloudless sky, with the sea-breeze freshly blowing, that the cities of Conception and Talcahuano, on the coast of South America, were desolated in 1835. At ten o'clock, two hours before their ruin, the inhabitants remarked with surprise, as altogether unusual, large flights of sea-fowl passing from the coast toward the interior; and the dogs at Talcahuano abandoned the town before the shock which levelled its buildings was felt. Not an animal, it is believed, was in the place when the destruction came. In 1805, previous to the earthquake at Naples, which took place in the night, but was most severely felt in the provinces, the oxen and cows began to bellow, the sheep and goats bleated strangely, the dogs howled terribly, and the horses fastened to their stalls leaped up, endeavouring to break the halters which attached them to the mangers. Rabbits and moles were seen to leave their burrows; birds rose, as if scared, from the places on which they had alighted; and reptiles left in clear daylight their subterranean retreats. Some faithful dogs, a few minutes before the first shock, awoke their sleeping masters by barking and pulling them, as if anxious to warn them of impending danger, and several persons were thus enabled to save themselves. On the recent occasion all the dogs in the neighbourhood of Vallo howled before the people were sensible of their danger. To account for these circumstances, it is conjectured that, prior to actual disturbance, noxious gases and other exhalations are emitted from the interior of the earth through crannies and pores of the surface invisible to the eye, which distress and alarm animals gifted with acute organs of smell.

A TALE OF HORROR.

Mr. ——, we shall call him Mr. Vellum, of Melbourne, is blessed with the friendship of Mr. ——, we shall call him Mr. Stockwhip, whose cattle-station is not a hundred miles from Echuca. Stockwhip is in the habit of sending down tongues, potted butter, rolled beef, and fifty other up-country niceties to his town friend as presents. On Tuesday last arrived at Vellum's office a good-sized keg, the address-card in the usual well-known handwriting. It was late in the afternoon, just about time to start for Paradise Villa, South Yarra; the gift was safely stored in the buggy, and off

Vellum started with the treasure. While tea was getting ready the keg was opened. "How heavy it is!" says one. "What on earth can he have sent this time?" says another. Speculation was not allayed when the lid was forced open, and only dry salt presented to view. "Dive deeper," was the order of paterfamilias; "there must be something else in it." The salt was carefully removed, and with considerable difficulty something bulky was dragged out, of indefinite shape and texture. "Perhaps it's a Murray cod," said one of the juveniles. "Seems to be some preparation of pork," remarked Vellum; however, let's have some fried for tea and see how it eats." Fried a slice or two of it; everybody tasted, but nobody liked it; it was horribly tough. "Perhaps we don't know how to cook it properly, suppose we try it to-morrow for breakfast." Stewed it was, and certainly it tasted a little more savoury, but still tough. The proper mode of cooking it had evidently not yet been hit upon; a piece was ordered to be boiled for dinner, and Vellum started for the day's business in Chancery Lane. There was the usual pile of letters to open, but one in Stockwhip's handwriting had the preference, and here it is:—"Dear ——, the scourge has reached us at last. Two of my finest bullocks were found dead in the paddock yesterday morning, and on being opened the indications of pleuro-pneunomia were unmistakeable. The left lung of one of them, Dr. —— here says, is the most perfect specimen of diseased structure he ever saw. I want Dr. Macadam and Mr. Miscamble to see it, and I therefore send it——to——you——packed——in ——salt." Vellum's eyes began to swim. He did not dine at home that day.—*Geelong Advertiser.*

OBITUARY.

We deeply regret to have to record the death of Mr. J. Jones, M.R.C.V.S., London, which melancholy event took place on the 4th of May. Mr. Jones, who had recently completed his sixty-first year, obtained his diploma July 24th, 1837, and entered on the duties of his profession in Worship-street, City, where he deservedly won for himself the respect of a large circle of friends.

Died, on the 24th of May, at Epsom, after a short and painful illness, Mr. William Smith, the successor of that early ornament of our profession, Mr. Ed. Bond. Mr. Smith's diploma dates July 10th, 1823. As a practitioner, he was highly esteemed; he always took a lively interest in the onward progress of the veterinary profession, and his kindness and hospitality will long be remembered by his friends.

THE

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Communications and Cases.

CARBOLIC ACID AS A DISINFECTANT, DEODORISER, AND THERAPEUTIC AGENT.

The use of the above acid, containing C_{12} H_5 O, HO (Fownes), was first advocated by Mr. M'Dougall, and adverted to by us now some little time since in an article on disinfectants and deodorisers.* Lately it has been most successfully employed for these purposes on the sewage water of Exeter, at the Devon County Lunatic Asylum, and in the horse-boxes and fish-vans on the South Devon Railway.

Mr. Ellis, in his report to the commissioners, says:

"The treatment of the sewage must necessarily be taken under two heads—first, its disinfection, so as to render it free from smell and prevent it causing any nuisance; secondly, to utilise it, in order to make it remunerative to the board. The average quantity of carbolic acid used per day, since its commencement, has been about one gallon, at a cost of 11d., diluted with lime-water in the proportion of about 1 in 250, and applied to the sewage about ten hours per day, Sundays excepted. The result, I have no hesitation in saying, has been most satisfactory. . . . . The action of the disinfectant on the sewage is not, as many suppose it to be, of a temporary character, viz., to abate and destroy smells for a time only, but on the contrary, the carbolic acid possesses considerable power to disinfect, though staying, or, rather, preventing decomposition, which prevents the sewage becoming putrescent and giving off offensive emanations, or again reverting to its former state; and when the sewage is once disinfected at the depôt, or in any part of the sewer, it matters little how long it takes passing off; decomposition cannot again set in, nor can any noxious gases be afterwards evolved in the atmosphere. Through the application of the disinfectant upon the sewage being previous to the commencement of decomposition, ammonia is not formed, but becomes locked up and preserved in the sewage, both in the liquid and solid state, which necessarily enhances its value very much in an agricultural point of view. This is of the utmost importance, as

* 'Veterinarian,' vol. xxxi, p. 61.

it also renders the sanitary state of the atmosphere in the immediate neighbourhood where the sewage passes comparatively pure, the carbolate of lime having answered the purpose of disinfecting the sewage, during the past three months of summer, and by the use of, on an average, about a gallon of carbolic acid per day, at a cost of 11d., whilst the quantity required to produce the same effect in winter, with the atmosphere at a low temperature, would be about two thirds that quantity. Thus estimating six months of the year at one gallon per day, at 11d per gallon, and say 1½*d.* per day for lime, would give a cost of 1*s.* 0½*d.* per day, or, for the six months, of 7*l.* 10*s.*; whilst for the remaining six months the price will be 5*l.*, giving the cost of the disinfectant for one year at 12*l.* 10*s.* The superintendence of the man, at 10*s.* per week, interest on outlay, and wear and tear, say 1*l.* 10*s.* per annum, will give a total of 40*l.* per annum. . . . . The disinfecting being satisfactorily overcome, the next and very important part, that of utilising the sewage and rendering it remunerative to the Board, requires attention. First, in order to utilise the sewage, it is of course necessary to procure the assistance of the owners of the property through which the sewage passes; and were they sufficiently acquainted with its value, it would not have flowed to waste so long unheeded; but as prejudice is frequently a barrier to improvements of this kind, it necessarily becomes a work of time to undertake and carry it out, however much its merits are known and appreciated. And previous to the application of the disinfectant several objections offered themselves in preventing its being undertaken as a whole, which now no longer exist: First, from the land immediately below the depôt, and through which the sewage passes, belonging to several owners, some difficulty was experienced in obtaining the sanction and assistance of the whole; but there would be no difficulty in that respect, as the whole may now be taken by Lord Devon and Sir Lawrence Palk, who are, I believe, both favorable to the scheme. Secondly, before the sewage became disinfected, it was thought necessary to apply the whole of it to the land at all times of the year, but which is now indispensable, as at certain times of the year the sewage when disinfected, might be allowed to pass down the course, as at present, and be carried off without any additional expense than that of disinfecting, which would be self-acting. Thirdly, another important advantage offers itself, which is the increased value of the sewage, after being disinfected, by locking up and retaining its manurial qualities until absorbed by the soil. . . . . I believe no difficulty whatever would be experienced in getting a sufficient number of shares taken up by practical persons who have long since perceived the desirability of facilitating and grappling with a question so considerably discussed and possessing such national interest—viz., that of returning to the soil those beef-growing properties which are well-known to exist in the sewage of our towns, instead of allowing it to empty into and pollute our rivers. As such a step would, in my opinion, be a stepping-stone to the utilising the whole of the sewage of Exeter, as I have no doubt but that our neighbours on the opposite side of the Exe will, at no very distant period, not only from the interest they will feel in improving the sanitary state of the neighbourhood where their sewers empty into the river, but also to recognise and remedy the great agricultural waste which at present exists—a waste which could be easily obviated and turned to a very profitable account."

The Sanitary Manure Company of Manchester also has lately taken this subject up, and apparently their product is likely

to be one of commercial value. Respecting it, Mr. T. Hudson, in a letter addressed to the Editor of the *Chemical News*, says:

"The deodorising process is the best that I am acquainted with, the manure being destitute of the offensive smell which accompanies most manures containing nightsoil. I believe this Company to have taken a correct view of the great question of sewage, as their process will not only relieve our sewers and rivers from the nuisance so seriously complained of, but will make that which is now wasted valuable for agricultural purposes. If the Company would prepare their manure without the water, ashes, &c. (amounting to upwards of 65 per cent), and were it supplied at a moderate price, it must create a demand from farmers. If this is found impracticable, then a corrective addition of bones, wollen waste, superphosphate of lime, animal matters, ammoniacal salts and nitrate of soda, become necessary, in my opinion, before it can safely be asserted to be 'a better and safer fertiliser than guano.' The probability of this last clause I leave for more experienced agricultural chemists than myself to decide."

As to its use as a therapeutic, Dr. F. C. Calvert, in a paper on it in the *Pharmaceutical Journal*, says:

"Although carbolic acid has long been known to possess powerful antiseptic properties, its use has been delayed in medicine owing to the difficulty experienced in obtaining it in considerable quantities and in a state of purity,* as well as to the caution required in introducing new substances in that branch of science. The success, however, which has lately attended its application, will tend greatly to increase its importance as a therapeutic agent. It has been used with marked advantage in the Manchester Royal Infirmary by several of its distinguished physicians and surgeons. Thus, Dr. Henry Browne has given it in solution in water in cases of chronic diarrhœa with very satisfactory results. Dr. Roberts has applied it with very great success in the dose of one drop, in cases of vomiting, even after after creosote had failed; he has also found it beneficial in cases of vomiting from dyspepsia, which disease is especially marked by pain after food. Mr. J. A. Ransome has used it for ulcers and other offensive discharges. Mr. Thomas Turner, in a note which he has communicated to me, speaks of carbolic acid in the following terms:—

"'It may be advantageously used as a solution of one part of acid in seven parts of water, in fœtid ill-conditioned ulcers. It alters the action of the blood-vessels, causing a purulent instead of a sanious discharge, and destroys almost immediately the offensive smell of the secretion. The ulcers having a communication with carious bone, or even necrosis (where the bone is dead), it has in its diluted state a good effect when injected into the sinuses leading to the diseased bones. When there is mere caries or ulceration of the bone it effects the healing process, and in necrosis it promotes the exfoliation of the dead portion. . . In gangrenous and all offensive sores it removes all disagreeable smell and putrescency, and may render the discharge innocuous to the contiguous living and unaffected tissues. In its diluted state, therefore, it is a great boon to patients labouring under that class of disease.'

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* This acid is now prepared for medical purposes by the Tower Chemical Works Company, near Manchester.

"Mr. Heath, house-surgeon of the infirmary, has used it with two parts of water as a lotion in sloughing wounds, and has found that in a short time after its application it entirely arrests the sloughing process, and produces a healthy appearance.

"Dr. Whitehead has used with advantage Dr. Robert Angus Smith's solution of sulphites and carbonates of lime and magnesia.

"In July, 1859, M. Velpeau drew the attention of the French Academy of Sciences to the value of the mixture of coal-tar and sulphate of lime of MM. Corne and Demeaux in the healing of ulcers and other offensive wounds; and it may be added, that this mixture was used with great advantage in the French army after the great battles of Magenta and Solferino.

"In the following month I forwarded a note to the French Academy, pointing out that from experiments I had made with the various substances existing in coal-tar, it was highly probable that carbolic acid was the active agent of the coal-tar used by MM. Corne and Demeaux, and that much more certainty might be expected if that acid were substituted in their mixture; for the composition of coal-tar varies according to the nature of the coal and the temperature employed in its preparation. I also suggested that it was probable that the powerful antiseptic properties of carbolic acid prevented the decomposition of the adjacent parts, and thus tended to restore the wounds to a healthy state and to remove the cause of infection. Before quitting this part of the subject, I beg again to call attention to a fact which I have already published in one of my papers, namely, that the addition of two or three drops of this acid to a pint of freshly made urine will preserve it from fermentation or any marked chemical change for several weeks.

"I have also applied it lately to foot-rot, which annually carries off large numbers of sheep, and I have been given to understand that the remedies hitherto adopted in this disease have been only partially successful. I think that if my experiments are further confirmed, it will prove a great boon to the farmers of this country.

"This acid has also been applied by me during the last twelve months to the preservation of gelatine solutions and preparations, of size made with starch, flour, and similar substances, and of skins, hides, and other animal substances. In fact, its antiseptic powers are so great, that it is the most powerful preventive of putrefaction with which I am acquainted. It appears also to act strongly as an antiferment, for I have proved on an extensive commercial scale that it prevents (as stated by me in a paper published in 1855) the conversion of tannin into gallic acid and sugar. It also arrests lactic fermentation. I am now engaged in a series of experiments to discover if that power extends to alcoholic, butyric, and acetic fermentations. I hope also to communicate to you shortly the results of my experiments on the protection of timber from dry rot."

In an article, also in the *Chemical News*, "On the Chemical Manufacturers of Lancashire," we find the following:

Disinfectants.—The manufacture of disinfectants has become a regular and constant one, and since the inquiries instituted on the subject by Mr. M'Dougall of this city, the use of those made in this district has been enormously increased. Mr. M'Dougall manufactures, near Oldham, a disinfecting powder, in which the properties of carbolic and sulphurous acid are taken advantage of. This is used to prevent decomposition in stables, cowhouses, and among accumulations of putrescible matter, and generally for the prevention of decomposition in manures. A liquid is also pre-

pared with carbolic acid and lime-water, which is applied for the purpose of preventing decomposition in sewers, according to the idea entertained by one of us, of purifying whole cities by preventing the generation of gases in sewer water or among accumulations of animal refuse. The liquid is also used to prevent the decomposition of animal matter when it cannot at once be made use of, especially in the case of meat brought to market, or animals that have died in the field. The solution of the powder has also been used, to some extent, in dissecting-rooms, where it immediately destroys any noxious smell, and at once liberates the fingers of the operator from the peculiarly nauseous odour which so often attaches to them. It has also been found useful in the treatment of sores, as well as of dysentery. Mr. M'Dougall has also applied carbolic acid to the destruction of parasitic insects on sheep, and has in many districts entirely driven out the arsenical preparations by the use of this acid united with fatty substances. Sheep dipped in it are not liable to be attacked by tick, even when left for some months among other sheep infected with it. Foot-rot and other diseases of sheep are also said to be prevented and cured by its use."

We have thought it not inopportune to allude to this subject at the present time, since a Select Committee has been appointed by Parliament to inquire into the best mode of utilising the sewage of towns, with a view to the reduction of local taxation, and for the benefit of agriculturists, and this the more, since as a profession, we are intimately associated with the last named.

The Select Committee have recently agreed to the following first report:

"1. That careful and exact experiments are necessary to elucidate the agricultural value of sewage, and the best mode of applying it. 2. That such experiments have been carried on at Rugby by the commission appointed to inquire into the best mode of distributing the sewage of towns, and applying it to beneficial and profitable use. 3. That it is desirable that these experiments shall be continued during the present year."

We know that there are chemical difficulties in the way of obtaining those matters which constitute the active principles or real worth of the sewage in a concentrated form; yet when it is borne in mind that the value of London sewage alone is nearly two millions a-year, which we are not only throwing away, but what is worse, spending millions yearly to make the waste more complete, it is time that something should be done to prevent this. And when to this is added the sewage of the country generally, the loss sustained is immense. Mr. Ellerman supposes the value of reproducing matter thus lost, to be £50,000,000 a-year, and Mr. Mechi says it is worth the cost of feeding London.

Mr. Brady, in moving for the select committee, stated that in a series of calculations made by several eminent men of

science, all testified to the great pecuniary value of the sewage of the country. One valued it at £15,000,000, another at £52,000,000, a third at £64,000,000, and Dr. Parkins, guided by the calculations of Professor Playfair, estimated its value at £93,283,000 a year. The figures might appear fabulous, still they serve to shew that it is time something should be done, and that not only in an economical point of view, but to prevent the engendering of disease both in man and animals by the emanations from decomposing excreta.

Moreover, it is feared by some persons that the supply of guano will ere long fail. Respecting this Baron Liebig says:

"In relation to guano I have been assured that in twenty to twenty-five years, if the use of guano should increase in even the same proportion as hitherto, there will not remain in South America enough to freight a ship. We will, however, suppose its supply and that of bones to continue for 50 years, or even longer; then what will be the condition of England when the supply of guano and bones is exhausted?

"This is one of the easiest of all questions to answer. If the common sewerage system is retained, then the imported manures, guano and bones, make their way into the sewers of the cities, which like a bottomless pit, have for centuries swallowed up the guano elements of the English fields, and after a series of years, the land will find itself precisely in the condition it was before the importation of guano and bones commenced; and after England shall have robbed the cultivated lands of Europe, even to complete exhaustion, and taken from them the power to furnish her longer with corn and manure, then she will not be richer than before in the means of producing corn and meat, but will from that time forth become even poorer in these means.

"It has been maintained that the recovering of the manure elements out of the sewers of large cities is impractible. I am not ignorant of the difficulties which stand in its way. They are, indeed, very great; but if the engineers would come to an understanding with the men of science in relation to the two purposes—the removal of the contents of the sewers, and the recovery of their valuable elements for agriculture—I do not doubt that a good result would follow. Intelligence, in union with capital, represents a power in England which has rendered possible and practicable things of much greater apparent difficulty."

Since the above was written, we have met with the following letter in the public prints, which we insert; for we concur with the opinion expressed by Lord Palmerston at a late

agricultural meeting, when he said, "he could not but think that the progress of chemical science, and the application of that science to agriculture, would lead to something that would render the farmers less solicitous about guano, and give them a reproductive substance nearly as good, to be obtained, not from the other side of the world, but at their own doors." As well as the statement made by Mr. Brady, that "no more important subject could occupy the attention of the House of Commons, for the most fearful results have followed from the neglect of the sewage question. Death, lurking stealthily in alleys, and courts, and cesspools, lay in wait to remove strong healthy men from the scenes of life."

"EXETER; *March 3rd*, 1862.

"Sir,—I have much pleasure in stating the results we have obtained by the utilisation of the sewage of the city of Carlisle during the last two years. As you are aware from Mr. Ellis's report, the sewage waters are disinfected by our process before application to the land, which serves the double purpose of entirely preventing any offensive odours or nuisance, and of preserving the manurial value of the sewage from loss by decomposition and passage into the atmosphere in the form of vapour. The land to which we apply the sewage is 13 feet above the level of the main sewer, through which the sewage is carried from the city. We, therefore, have to pump it a height of 15 feet to give a fall for conducting over the land. This is effected by one of Gwynne's pumps, worked by a steam-engine. The disinfected sewage is thus conducted over in the manner described in Mr. Ellis's report. The results of its application have been very satisfactory. During the two years we have confined it to 80 acres of land, which it has greatly enriched, and is very much increased in value, so much so, that we are now making the necessary arrangements to carry the sewage over 40 acres of land which we held in reserve. We expect that the 80 acres which have been irrigated will continue to give the same abundant crops. We have been enabled to feed a large number of sheep and cattle, and I am glad to say they thrive exceedingly well upon either the grass mown and taken to them, or grazing upon the land. We have reserved a portion of the irrigated land for mowing to sell cut grass, and we this year have been able to cut this for sale five times! We have also made hay of the grass, and find the hay is of first-rate quality, and keeps as well in stack as any meadow hay. Commercially speaking, we are satisfied with the result. Although it has in some sense been experimental, and

we have seen reason to alter our plan of applying and conducting the sewage over the land, which has involved expense, we have realised a profit, and are confident that the coming season and succeeding years will very well remunerate us. I know that my father will have much pleasure at any time in answering any inquiries you may wish to make, and to afford any information on the subject in his power.—I am, sir, yours very respectfully,

"ALEXANDER M'DOUGALL, jun."

Allied to the above is the proposed inquiry, moved for in the House of Lords, by the Earl of Derby, and carried, into the injuries caused to the land by noxious vapours evolved during certain manufacturing processes, which poison the air and the rivers, destroying both animal and vegetable life. This is seen in the arsenical vapours emitted from tin works, and during the smelting of copper; of muriatic acid gas, in the manufacture of soda from common salt and sulphuric acid, and other gaseous compounds from lead and other works. The object of his lordship is to protect the community from the injurious effects of these eliminations. Thus it is that science comes to the aid of commerce; for rightly has it been said that, "Agriculture has been called forth to take its position in commerce, and commerce is learning its identity with the interests rooted in the soil;" whilst man's inventive powers are exercised to prevent the evils that would otherwise arise in the production of the necessaries of life, and to utilise that which might prove poisonous. It is true that many of those necessaries, so designated, are artificial, nevertheless they are the result of the progress of civilisation, which it is impossible to check, nor is it desirable to do so. At any rate, it cannot be gainsaid that health is of paramount importance, whether in an animal or a vegetable; and each, the highest as well as the lowest, is alike dependent on the same physical causes for existence, while each also subsists by and for the other, constituting the great circle of organisation.

COMMUNICATION

From F. R. SILVESTER, M.R.C.V.S.

ST. ALBANS; *June* 12, 1862.

MY DEAR SIRS,—There is an error in this month's *Veterinarian,* in the report of what I said at our last annual

meeting; and as I have had a letter from a practitioner, and may have others, I shall feel obliged if you will correct it in your next number.

I am made to say (alluding to Mr. Ernes' committee) "that every practitioner HAD HAD a circular," it should have been "every practitioner *would have* a circular."

I remain, yours faithfully.

To the Editors of the 'Veterinarian.'

COMMUNICATION FROM A GRADUATE.

MESSRS. EDITORS,—I am one of those unlucky mortals alluded to by Mr. Helmore in the last report, in the *Veterinarian*, of the meeting of the College of Veterinary Surgeons; viz., I entered the Royal Veterinary College, and attended two years, and, perhaps, paid as much attention as most of my brother students. I also paid my ten guineas, and was examined in due course, and, of course, was plucked. Since then, such has been my situation in life that it would cost me far, far more than I could in any way spare to again attend even for a month in order to present myself for another examination; for such is the peculiarity of my profession, and so much does its success depend on my personal *surveillance*, that I believe my employers would not tolerate any absence, whatever might be the excuse made by me; and I am pretty certain that were I to attempt to visit the college again, that every two or three days I must be compelled to return. Now I have no desire to shelter empiricism, neither have I any wish to shield those who go to college and drink in porter instead of knowledge; but this I do hope, that in any steps which may be taken relative to the matter of "recognisation," that no injustice will be done to those placed in an unfortunate position like my own. I am grateful for what the college has conferred upon me in its teachings, and I hope it will not now do aught to mar this feeling of gratitude. But for me to pass an examination now would be impossible, although I am certain that I could convince any man of my ability to practise in an hour's conversation.

I write these hurried lines to induce my professional friends to think before they act, so that they may sympathise with a brother, and not add an injury to the misfortune of his having been plucked!

I am, yours truly,

A GRADUATE FORTY YEARS OLD.

To the Editors of the 'Veterinarian.'

PROPOSED EXAMINATION OF VETERINARY PRACTITIONERS.

By C. H. Wadlow, M.R.C.V.S., Oxford.

Gentlemen,—There are a great number of men in this country practising the veterinary art who are not members of the college, nor have they been at any of the public veterinary schools; yet I have frequently heard it said by their employers, as well as by themselves, that they could pass the examination if they had had an opportunity of doing so, but that they could not spare the time for the required attendance at the college; therefore I suggest for the consideration of the board, that a bye-law should be passed, to enable all those who choose to submit themselves before the board of examiners, to be at liberty to do so, by paying a fee of £25, and if they passed to receive a certificate to that effect. By such a course, the public will be enabled to select the competent men from the incompetent amongst that class of practitioners, and it would also give those who are educated men (and I hope there are some amongst them) an opportunity of showing the world that they are what they profess to be, and not ignorant pretenders.

I am, gentlemen,
Yours faithfully,

To the Editors of the 'Veterinarian.'

POISONING OF DOGS WITH STRYCHNINE.

By W. Watson, M.R.C.V.S., Rugby.

Few subjects in connection with poisonous agents have attracted more attention during the last few years than the poisonous influence of strychnine. Man and animals have alike fallen victims to its fearful agency to a very serious extent, and, although our most able chemists and toxicologists have devoted much time and labour in investigating and bringing to bear certain symptoms and tests by which its presence may be indicated, and very minute quantities shown to exist, yet much in connection with its physiological action has yet to be made known.

The following account of its poisonous effects upon dogs came under my notice a few weeks ago, and although possessing nothing new in connection with this subject, I am nevertheless inclined to think that it has features of sufficient interest to induce me to forward it for insertion in your journal, deferring my usual remarks on botany to a future month.

The dogs in question were a Skye terrier bitch and a large retriever dog, which along with several other dogs belonging to Mr. Mauder of this town, were secured in kennels in a yard at the back of his premises. On the evening of May 8th, Mr. Mauder being from home, an attendant took the retriever dog and the Skye terrier bitch (the latter suckling four whelps at home) with him for a walk along the banks of the river Avon, and after being out with them for about two hours he brought them home, both animals then appearing in perfect health. On the following morning the terrier bitch was allowed to come into the room in which some of the family were at breakfast, but had not been there long before she was observed to fall suddenly on her side, her head being drawn backwards (opisthotonos) and after a few convulsive struggles she expired. Being much alarmed, they immediately sought assistance, when my partner, Mr. Walker, attended at once, and finding the bitch dead he went to look at the other dogs. His attention being attracted to the retriever dog by his not coming from his kennel, he had him removed, and had hardly done so when the animal became convulsed, and died.

In a short time after I accompanied Mr. Walker to look at the other dogs, and finding them all well, we examined the two dead animals. The bitch was lying upon her side, her head drawn backwards, and every part of the body very stiff. So rigid indeed had every muscle become, that by taking hold of one of the hind legs, the whole body of the animal could be supported in any position. The body of the retriever dog on the contrary was destitute of rigidity, the muscles being relaxed.

A consideration of the symptoms and appearance induced us to attribute death to poison, and in all probability to strychnine. The owner being desirous that a thorough examination of the bodies should be made, I had them removed, and during the afternoon proceeded to make a *post-mortem* examination. The first I examined was the Skye terrier bitch, and was surprised to find the extreme rigidity that had taken place immediately after death had entirely disappeared, the whole muscular system being perfectly relaxed.

Externally everything appeared natural. On opening the thorax, the lungs were found slightly congested, the heart and its membranes healthy, the left side containing a considerable quantity and the right side a small quantity of dark semi-fluid blood. The stomach and intestines externally presented no unnatural appearance, both being nearly empty, the former containing only a small quantity of partly digested food, apparently bread, and its inner coat very slightly inflamed. The bladder was empty, and like the rest of the abdominal viscera, appeared healthy. The brain and its membranes were considerably congested.

The body of the retriever dog was in the same condition as seen immediately after death, no rigidity having takeu place. The lungs were much congested, the heart healthy, and in every respect like the dog previously examined, as regards the right and left side containing blood. The stomach contained a considerable quantity of food, principally bread, and its inner coat was redder than natural. The bladder was full of urine, and, with the rest of the viscera, was in perfect health. The brain and its membranes, as in the one previously examined, were much congested.

Having secured the stomachs and other parts necessary, I proceeded on the following day to make an analysis. The method I adopted was that recommended by Dr. Macadam in a lecture on strychnine, to be found in the *Pharmaceutical Journal,* namely, by mascerating the materials to be examined some hours in a dilute solution of oxalic acid, and after filtering and boiling to get rid of the albuminous matter, adding animal charcoal, evaporating to dryness, and then adding alcohol, applying heat, and, after removing the charcoal by filtration, evaporating the residue to dryness in a porcelain vessel over a water bath. Having proceeded in this manner with the stomachs and a portion of the blood of both animals, the following tests gave clear evidence of the presence of strychnine :

Taste, exceedingly bitter.

Sulphuric acid (with trace of nitric acid) and *binoxide of lead,* a dark *violet* changing to a *brick-red colour.*

Sulphuric acid and *bichromate of potash,* a *violet* changing in a short time to a *brick-red.*

How these animals obtained the poison will probably never be known, as all our investigations on the subject proved nothing. It is somewhat singular that the two animals alone affected should be the ones which had been out the previous night, and this might at first indicate that the poison had been picked up by them at that time, but the

length of time that elapsed before its effects became shown seems to do away with this supposition.

Another peculiarity was in the marked difference presented by the bodies after death; the one becoming very rigid and in a short time passing away, and no rigidity taking place in the other.

INTERNAL HÆMORRHAGE, ASSOCIATED WITH INFLAMMATION OF INTESTINES—CAUSE OF DEATH?

By Chas. Moir, V.S., Glasgow.

On the 16th of March last, I was requested by Mr. Nixon, of the firm of Nixon and Company—the Navigation Coal Company—to go to their works and make a *post-mortem* examination of a horse which had died the day previously. As they had lost four horses within three weeks, suspicions were entertained that there was foul play going on somewhere. I was also requested to examine the food, water, ventilation, &c., which I did, but did not detect anything which would account for the mortality among the horses.

On opening the abdomen, I found a great quantity of blood within the cavity which had evidently escaped from a ruptured vessel. The intestines were inflamed throughout. The mucous coat was soft and could be easily scraped off. Large quantities of worms—*Lumbricoides*—were found in the small intestines. The mouth, fauces, and œsophagus, showed no trace of inflammation, the cuticular coat being perfectly healthy. The kidneys were softened throughout, with the exception of a small portion in the very centre. Their capsules were completely disorganized, and there was no fatty matter surrounding them; they were almost as easily lifted from the psoas muscles, as they could have been from off a table. The intercostal muscles, and those of the lumbar region near the seat of the kidneys were thickened, and gave indications of having been injured at a previous period. The ureter and bladder were healthy. The liver was firm but pale in colour. The lungs had also a grayish-white appearance, but were perfectly pervious. The heart was healthy, and contained a very small quantity of blood in both of its ventricles. The large bloodvessels were nearly empty.

Mr. Herapath of Bristol had been communicated with on the subject, and he wrote back to say that he required certain parts of the digestive organs, and their contents; among which was to be a part of the contents of "the *second* (?) *stomach, not the bread basket.*"

As Mr. Nixon had left for London, I was requested by the manager to forward Mr. Herapath what he wanted, and also to furnish him with an account of the *post-mortem* appearances. I sent a portion of the stomach and its contents, with some of the contents of one of the large intestines. He wrote back to say that he found the contents of the stomach and intestine strongly acid—indeed that they contained as much *sulphuric acid* as would account for death. He added that this agent was sometimes administered to horses by ignorant persons to give the animals a glossy coat. He also stated that there was sufficient to account for death independent of the acid, as the *post-mortem* examination had shown.

The history of the case, as far as I was able to learn it from the farrier whom the company keeps to attend their horses, was as follows:—The horse was to all appearance well enough when he was put into the stable at night, and nothing was observed wrong with him until eleven or twelve o'clock, when he was noticed to be suffering from abdominal pain. The farrier had given a pint of castor-oil in combination with an ounce of tincture of opium, but without benefit, as the animal continued in great pain, with very slight intermissions, until the morning, when he died. The other horses, I was told, had all been taken ill, and died in the same way. They had been worked very hard for some days previously to their death. Very often they don't get good usage when at work, as the men who drive them have nothing to do with either cleaning or feeding them.

I confess that, notwithstanding Mr. Herapath's report, I am still an unbeliever in sulphuric acid being the cause of death. If it had been given, some evidence of this must have been shown in the mouth or œsophagus; or, supposing it could have been given in the form of a ball, this would have been dissolved in the stomach, and acted on its mucous coat.

My opinion is, that death arose from internal hæmorrhage. Farriers, horsekeepers, and others, give large quantities of flowers of sulphur, and sulphuret of antimony, as alteratives —could such by any chemical change be converted into sulphuric acid in the horse's intestines? With regard to the dose of sulphuric acid; I have frequently given cattle from

one to two ounces in water or water-gruel, twice or three times a day, and often with success in pleuro-pneumonia.

I may also state that the chemist, who dispensed the medicine used at the works, denies having used sulphuric acid, either as a solvent or otherwise, and no druggist in the neighbourhood has sold such an agent to any person lately.

[We agree with Mr. Moir that the *post-mortem* examination militates against Mr. Herapath's opinion of death being caused by the administration of sulphuric acid.]

CASE OF RUPTURED STOMACH.

By John Read, Clitheroe.

The subject of this communication was a five-year-old carriage mare, belonging to James Hindle, Esq., of Sabden, about four miles from Clitheroe.

She had been regularly worked, and was apparently in good health, until Thursday the 13th of February last. On Friday morning, the groom noticed that a severe cough was present, and the usual symptoms of catarrh. The food was changed, and her regular work suspended, but she ate the mashes which were given her, with avidity.

On Monday night (17th) the groom came to Clitheroe, gave me the above history, and told me that his master considered the mare was worse; further, that the near hind leg was slightly swollen, but that she had been liable to this swelling occasionally, ever since an injury received during breaking.

No request for a visit by me was made, as it was late.

I sent a fever ball, with orders to foment the swollen leg, and to apply a loose bandage, promising to visit her early the following morning.

18th, 8 a.m.—On arriving, I found my patient laid down at full length, apparently exhausted, although to all appearance free from pain. The respiration was slightly accelerated; the pulse 54 beats per minute, and easily compressed; the visible mucous membranes injected; the mouth hot, with a profuse discharge from one nostril; the extremities rather cold, and slight tremor of the muscles. She passed a quantity of fæces during my examination, and shortly afterwards got up with some difficulty.

During the morning she had drunk about six quarts of chilled water. I then found that the swelling had entirely left the near hind leg, but the off one was swollen from the thigh to the fetlock; the slightest pressure causing great pain. The respiration became quick and extremely laborious; the pulse rose from 54 to 68 per minute; the visible mucous membranes became still more injected; ears and legs cold, and the surface of the body bedewed with a cold perspiration, with indications of severe pain, apparently situated in the abdomen. There was not the slightest tympanitis.

My prognosis was unfavourable, the case appearing a hopeless one. I left, however, to procure some stimulant from a druggist close at hand, and on my return, in a quarter of an hour, the mare was dead.

The cause of death I supposed to be a rupture of some portion of the abdominal viscera.

Post-mortem examination.—Upon laying open the abdomen a large quantity of semi-digested food was seen floating amongst the intestines; the cavity of the abdomen contained about three gallons of fluid; the peritoneum was injected in patches; the mesentery presented a strange appearance, being almost black; the intestines contained very little fæces; the stomach was almost empty, having a rupture of about ten inches through all its coats, and which apparently was of recent occurrence. The lining membrane was injected in different places, and all the coats were in a weak condition. The duodenum was very much discoloured and easily torn, and there were patches of congestion over the whole intestinal canal. The liver and spleen were both much enlarged.

On removing the skin from the hind legs, I was surprised to find the areolar tissue congested and dark-coloured.

[In reply to the question put by Mr. Read—"Is there not reasonable ground for supposing that mechanical distension, arising from the large quantity of sloppy food in the stomach, was the cause of its rupture?"—we are of opinion that this took place at the time of death; the digestive process being interfered with by the previously existing illness, which led to an over-distension of the stomach, and a weakening necessarily of its coats.]

ON THE DIPPING OF SHEEP IN AUSTRALIA.

[We have received the following remarks from Mr. Annand relating to his article upon the above subject in our last number.]

Dear Sirs,—I only to-day succeeded in obtaining the June number of the *Veterinarian*, or I might have addressed you earlier.

In the first place, I take umbrage at the sole use of the word "*prevention*," to the complete exclusion of that of "*cure*," in my article; the employment of the materials I have mentioned, in the manner I have described, being fully adapted for that very desirable consummation. *And, again*, by excluding the word altogether (I am sure I used it in my communication) it makes a very lukewarm effusion of the whole, so that that amount of attention is not so likely to be drawn to the matter as it deserves.

Secondly, in the thirteenth line from the bottom, it reads "*Men are placed in the bath*," it should be "*around* the dip." You will readily perceive the importance of this new reading, and its effect on the method of *working*.

In conclusion, I would say that your illustration is an admirable one. And I have not the slightest doubt that practical men, from these few hints, will be able soon to record that "*scab*" in England is one of those things that *have been*, and no more to be feared than it is in the *Western district* of *Victoria*.

Trusting that these few remarks will meet your approbation,

I remain,

Faithfully yours,

Joseph Annand,
Veterinary Student.

To the Editors of 'The Veterinarian.'

Facts and Observations.

ACCLIMATISATION OF ANIMALS.

The society founded for the purpose of adding to the list of our birds, beasts, and fishes, appears to be making progress. From a report issued by it, it is evident that something has been done, and more is anticipated.

A small flock of Chinese sheep have, for example, been introduced. This variety of the ovine tribe is wonderfully fruitful, the ewes producing three and four at a birth. The wool, though scanty, is valuable; and the flesh is not inferior to that of Welsh mutton, so dear to connoisseurs. Thus, if the little flock of the society should continue to flourish, an important step is already made. It has, besides, conducted some extremely curious and useful experiments—the sambar of Western India with the red-deer, the pin-tail and the common duck, and the Himalayan "cheer pheasant" with the English bird. It has domesticated, with more or less success, the Japanese deer, the guan, and curassow, the sand-grouse of China, and the quail and prairie-grouse from America, as well as the fine black "Kallagee" pheasant from Central Asia. An effort made to introduce the "Murray cod" failed by a misadventure, but craw-fish have been very successfully transferred from English to Scottish waters; and the Tay has returned the compliment, having transmitted some of its pearl-bearing muscles to Southron streams. The *Dioscorea batatas,* or Chinese yam, and the Brazilian arrowroot, have been cultivated by the agency of this admirable society in the Channel Islands. But, perhaps, as notable a movement as any is the importation and complete acclimatisation by Lady Dorothy Neville—a member of the society—of the Cynthia silkworm. A French silk buyer pronounced the cocoons produced by her ladyship "magnifiques," and eagerly offered to purchase all she could supply.

FECUNDITY OF HYBRIDS.

M. St. Hilaire, from experiments on the reproductive power of hybrids, formed by the alliance of species of the same genus, has arrived at the conclusion that while there were a great many sterile hybrids, and also a great number

imperfectly fecund; yet there were others that possessed the power of reproduction, either with stock species or among themselves. He is also of opinion that such commingling of species occurred much oftener than is usually thought to be the case.

NEW METHOD OF DETECTING NITRIC ACID IN THE DRY WAY.

Professor W. Stein gives a method for detecting nitric acid in the dry way when combined with bases. When heated the nitrates of potash and soda give off oxygen, and form fixed nitrites. The nitrates of baryta, strontia, and lime, together with those of magnesia, alumina, and the heavy metals, when heated, give up the nitric acid, which is split into oxygen and nitrous acid. As however we do not always know with what base the acid may be combined, the author recommends the following mode of testing:—He heats the substance in a test-tube either with bisulphate of potash or oxide of lead, placing in the upper end of the tube a strip of filtering-paper moistened with a slightly acid solution of pure sulphate of iron. If the nitrates are present only in so small a quantity that the nitrous vapour is not itself perceptible, the paper becomes of a yellowish-brown colour. In this way the author discovered the 2000th part of nitric acid in a mixture, which by the usual moist way would have been impossible. The process is particularly applicable for the detection of nitric acid in spring waters. In applying the test it is necessary to guard against heating the paper. In the presence of chlorides the employment of bisulphate of potash is objectionable, because the liberated chlorine colours the paper by forming chloride of iron. The presence of protoxide of iron or much organic matter in the substance also interferes with the bisulphate of potash test.

CONSTITUENTS OF THE FLOWER OF THE ARNICA MONTANA.

The flowers of *Arnica montana* have been analysed by Walz who found them contain a bitter principle, Arnicin= $C_{70}H_{54}O_{14}$, an ethereal yellow oil, two resins—one soluble in ether, the other not—tannin, a yellow colouring matter, a white fat melting at 28°, and a waxy matter.

PREPARATIONS OF LACTIC ACID.

Lautemann recommends that oxide of zinc be substituted for chalk in the preparation of lactic acid by the fermentation of sugar and cheese. The mixture must be kept at the temperature of 40° to 45°, and frequently stirred. The operation is completed in about eight or ten days. The mixture is then boiled and filtered, and the liquor evaporated, to obtain the lactate of zinc. One or two crystallisations will furnish this salt sufficiently pure for the preparation of the acid, which is done by precipitating the zinc with sulphuretted hydrogen. Some mannite is always present, but may be separated by concentrating the solution, and extracting the lactic acid with ether. The mannite remains in the aqueous solution.

GLYCERINE A SOLVENT FOR ARSENIOUS ACID.

Arsenious acid appears to be very soluble in glycerine. M. Cap states that equal equivalents of the two substances combine, yielding a viscous body, which solidifies at the freezing point of water, and presents the appearance of ordinary fat.

SOLUTIO ATROPIÆ GLYCERINEA.

Under the above name, a solution of atropia, the active principle of the deadly nightshade in glycerine, has been recommended by Mr. R. C. Tichborne, for dilatation of the pupil in cataract, iritis, &c.

He objects to the use of the extract of belladonna, because of its "liability to produce cutaneous irritation; secondly, its requiring great attention in keeping the surface moist with some lotion to prevent its drying; and thirdly, want of cleanliness, as the extraneous manners of the inspissated juice are certainly very much out of place when manipulating with so delicate an organ as the eye; and in some cases complete failure results either from the use of a bad preparation or non-absorption from harshness of the epidermis."

Glycerine has been found to possess great solvent properties, particularly as regards the alkaloids, and some of the

non-nitrogenous organic principles, especially if a gentle heat be applied.

OINTMENTS OF IODINE.

Mr. H. Hall, to avoid the grittiness always objectionable in these unguents when carelessly or quickly prepared, proposes first to dissolve the iodide of potassium and the iodine in a small quantity of glycerine, and then to add the lard. In this way the compounds, he says, may be made perfectly smooth, and in a very short time. When large quantities are required, labour may be saved by heating the lard to a creamy consistency, and stirring in the solutions.

SOLIDIFICATION OF CARBONIC ACID.

Carbonic acid has been obtained by MM. Loir and Drion in the form of a colourless mass of transparent ice, which soon breaks up into large cubicular crystals, on exposure to air, returning to the gaseous state by the influence of liquid ammonia, lowered to the point of solidification, towards 81°, and the pressure of three or four atmospheres. In about half an hour, the experimenters state, all that portion of the tube containing carbonic acid, which is plunged in ammonia, becomes covered with a thick stratum of crystals, which rapidly augments.

SOURCE OF THE METALS.

The theory seems to be gaining ground that water is the original source of the metals. Gold has been conjectured to be an oceanic deposit, and of silver an immense quantity is said to exist in an exceedingly diffused solution in the sea; Captain Maury estimates it at no less than two hundred million millions of tons, and it has been calculated that, in the course of six years, the sheathing of the vessels of England, France, and America, acquires therefrom as much as nine tons of this metal.

THE VETERINARIAN, JULY 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

ON ANALYSIS BY LIQUID DIFFUSION.

Not entertaining the least fear of contradiction, we lately asserted that we derive many advantages from an application of the principles of chemistry to our division of science, and especially by the modes of analysis in cases of suspected poisoning.

How frequently is it the case that the practitioner of Veterinary Medicine has to combat the effects of some toxic agent, which has been either accidentally partaken of by an animal, or maliciously administered? It behoves him, therefore, to be conversant with the antidotes that are necessary to be resorted to, to counteract the action induced, or to form with the agent an innoxious compound in the organism; and to what division of science, but chemistry, can he turn for this knowledge? Again, how frequently is it that he is called to a case, and the symptoms evinced are very ambiguous? It terminates fatally, and a *post-mortem* examination discloses certain morbid changes existing in the tissues; these he is led to conjecture are produced by the action of some poisonous substance, but what that substance is, chemistry alone can demonstrate.

It is true there are chemists who make investigations such as these their particular study; hence the too-ready disposition of many persons to send "suspected matters" to an analytical chemist, whose opinion would be accepted as decisive, and who, from experience, and having all the requisite means at hand, is enabled to carry out the inquiry with greater facility and satisfaction than they can. Especially is this the case with the older practitioners, in whose time the curriculum of the College was not so perfect as it is now; no instructions being then given for the conducting of analyses, nor was the specific action of poisons on animals

explained either by lecture or otherwise. We contend that the medical practitioner ought not to be altogether ignorant of these things. If the Veterinary Surgeon has not made toxicology his study, how would he be able to act when called to a case of poisoning, the deleterious agent being ascertained, or at any rate more than suspected? Unacquainted with the counter-agent necessary to prevent its influence on the system, the animal dies; whereas, had the antidote been timely given, such a result would not have taken place. All hap-hazard and guess-work here, it need not be said, is of little use; sometimes, indeed, it is prejudicial, while at all times it gives proof of the lack of scientific education. We say nothing of the conclusion that is too often "jumped at," when the symptoms are both unusual and urgent, and when, likewise, there is an absence of those lesions in the tissues or organs, by which the action of poisons is commonly recognised.

This does not, however, apply alone to the Veterinary Surgeon; the practitioner of human medicine has to contend against the same, and whole communities often become thus erroneously and morbidly impressed, as history abundantly records. Of course the most searching and careful analyses of the chemist are here altogether futile, since it is mere suspicion, and has no basis in truth. Suspected poisoning, we fear, is frequently only a scapegoat for ignorance.

In poisoning not only are the lesions produced characteristic, but there are certain unmistakeable signs indicative of their action during life, with which the practitioner should be familiar, and these alone can be known by having devoted some portion of his time to the study of this important subject.

We have been induced to write thus much as prefatory to a new mode of chemical analysis, recently discovered by T. Graham, Esq., F.R.S., and designated by him "Liquid Diffusion applied to Analysis," an account of which appears in the 'Transactions of the Royal Society for 1861.' The apparatus is called by him 'The Dialyser,' and consists, according to Mr. Griffin's description, of a species of sieve, having gutta

percha sides and a parchment-paper bottom. The mixed liquid that is to be analysed is put into the dialyser, and the dialyser is floated in distilled water contained in a flat basin. At the end of twenty-four hours, the crystallisable substances contained in the mixed liquid will have become diffused in the distilled water of the basin, leaving the gelatinous substances of the mixture still in the dialyser.

By means of this dialysing apparatus, arsenious acid, metallic salts, strychnine, and other poisons, mineral and organic, can be readily separated from organic solutions in medico-legal inquiries. The process has the advantage of introducing no metallic substance or chemical re-agent of any kind into the organic fluids. The arrangement for operating is also of the simplest nature. Very minute quantities of arsenic have been separated by the dialytic process from egg albumen, gum arabic, isinglass, milk, porter, blood, and animal intestines, and obtained in a solution fit for the application of re-agents.

The dialyser serves also for the separation and decomposition of many metallic salts; for the separation of urea and other crystallisable salts from urine; for the separation in general of all *crystalloids* or crystallisable bodies from all *colloids* or gelatinous bodies; and for the preparation and purification of such colloids as hydrated silicic acid, hydrated alumina, gelatine, albumen, starch, caramel, tannin, gummic acid, &c. In short, the dialyser is an instrument of great practical utility to all chemists, physiologists, &c., who are engaged in researches into the composition of organic or mixed liquids.

Instructions for operating with the Dialyser.—The dialyser consists of two gutta percha hoops, one of them two inches deep, and the other, one inch deep. The two-inch hoop is slightly conical, and the one-inch hoop goes over the small end of the two-inch hoop. Both must be washed very clean with distilled water. The parchment paper that is to form the bottom must be about three inches wider than the small end of the two-inch hoop.

Soak the parchment paper for about a minute in distilled water; stretch it evenly over the small end of the two-inch

hoop, and strain it tight by pushing over it the one-inch hoop. The paper must be pressed smoothly up round the outside of the larger hoop, and the bottom must be quite flat and even. There must be no small holes in the paper. To try this, put distilled water into the dialyser, to the depth of a quarter-inch, and place the dialyser on some white blotting-paper. If any wet or dark spots appear, they indicate the existence of small holes. To close such holes, apply to the under surface of the paper about the holes some liquid albumen, put on a small patch of parchment paper, and iron the patch with a hot smooth iron. This coagulates the albumen, fixes the patch, and closes the hole.

The dialyser being prepared, the liquid to be operated upon is to be put into it, to the depth of not more than half an inch, and the dialyser is then to be floated on distilled water contained in a flat basin. The quantity of the water in the basin should be about five times as much as that put into the dialyser. The whole is then to be set aside for twenty-four hours.

A dialyser of six inches diameter serves to operate upon seven or eight fluid ounces of liquid; one of eight inches diameter for twelve or fourteen fluid ounces; one of ten inches diameter for twenty fluid ounces; and one of twelve inches diameter for thirty fluid ounces. The wider the dialyser and the greater the quantity of distilled water used in the outer basin, the more rapid and effective is the diffusion.

Professor Graham, in explanation of his method, divides substances into two classes—*crystalloids*, those which have a tendency to crystallize, and are of high diffusibility; and *colloids*, which are of low diffusibility, affect a vitreous structure, and have little effect on the volatility of the solvent. Animal gelatine is the type of the colloids; the plasticity of which, and its cognate compounds, renders them peculiarly fitting for animal organization, and as media for liquid diffusion, whilst their identity is still retained. To give an illustration of the manner in which analysation is conducted by the "dialyser," we may take the following:—A mixed solution, containing sugar and gum, was placed upon the

septum of the apparatus already described, to the depth of half an inch, and this floated upon a large quantity of water. In the course of some time the sugar, a crystalloid, by high diffusibility, separated itself from the gum and became dissolved in the water, while the gum remained on the septum undiffused. Defibrinated blood having a few grains of arsenious acid in it, being similarly treated, was found to yield up the greater part of the acid to the water in the course of twenty-four hours. It is stated that the diffusate was so free from organic matter, that the arsenic could be readily precipitated by means of sulphuretted hydrogen, and weighed.

"The separating action of the septum by this process is called *dialysis*, under which designation a great revolution will doubtless be effected in the processes of proximate resolution. The applications of this method in judicial investigations, in the detection of adulterations, and in researches into the subtle phenomena of animal and vegetable life, will be of immense value, because simple beyond all precedent in the history of chemical practice. Other, and apparently remote departments of science, will be aided by the discovery of dialysis; and we shall not be long in learning, that we have a talisman to unlock some of the secrets of the molecular structure of bodies."

Dr. Odling, speaking of the advantages likely to be derived from the discovery of dialysis, or the capability which some bodies have, and other bodies have not, of passing through membranes, and of the broad distinctions between the two classes of bodies, says:—"It bids fair to open out an entirely new field of inquiry. The constant intervention of colloid septa in so many of the phenomena of animal and vegetable life, gives to the subject of dialysis a high physiological interest, and it will, doubtless, exercise an important influence on the progress of physiological research. It will also serve to explain many of the phenomena of inorganic nature, more especially in relation to bodies which are now crystalline, but were once colloidal. It will also be of the greatest service in its applications to toxicology, pharmacy, and practical chemistry, by enabling us to effect a most

perfect separation of different substances which could not be separated by any other means."

Dr. Miller, referring to this interesting method, as one of most extensive application, considers it necessary to put some ardent minds upon their guard, as many have hastily assumed, in a spirit of self-confidence, that we have already a key to everything on this subject. A possible way to a new truth has indeed been opened; and here, doubtless, as in all other cases where we are permitted to obtain a further glimpse into the machinery of the universe, we shall but see fresh proofs of exhaustless wisdom on the part of the Great Author of nature; but instead of boasting of our triumphs, we shall, if we pursue our researches in a right spirit, be taught a lesson of reverent humility, as we are allowed to raise a fresh corner of the veil which separates that which is known to man from the infinitely greater portion which still lies beyond. Doubtless this branch of science is yet in its infancy, and therefore not yet perfectly systematised.

An interesting lecture on this subject has lately been delivered at the *Pharmaceutical Society of Great Britain* by Professor Redwood, in which he says:

"The term DIALYSIS has been applied by Mr. Graham to designate the separation of chemical atoms or molecules by *liquid diffusion*, that is, through the greater or less tendency which the molecules have to move from one part of a liquid menstrum to another, under particular circumstances. It is *chemical analysis* effected without the employment of *chemical reagents*, and it constitutes one of two very important additions which have recently been made to this department of practical chemistry. If it afford a less delicate means, as undoubtedly it does, of indicating the presence of minute quantities of chemical agents than that which is afforded by the method of *Spectrum Analysis*, it nevertheless admits of practical applications of which the other is not susceptible, for it enables us to separate bodies from each other, and doing this through the agency of physical forces inherent in the bodies themselves, it gives us results which are free from the influence inevitably exerted, in ordinary chemical analysis, by the reagents applied."

"The term *Diffusion* has hitherto been principally applied to phenomena observed among gases and vapours. The diffusive property here is universal, and very important in its influences. No two gases can be brought into contact with each other without the occurrence of diffusion. Thus, if we have two gases contained in separate vessels, such as two bottles, and if we establish a communication between them by means even of a small tube, the contents of one bottle will immediately flow into the other, and *vice versâ*. This will even occur in opposition to gravity; for if the one gas be light, such as hydrogen, it will pass downwards into a heavy gas, such as carbonic acid, or sulphuretted

hydrogen, and the heavy gas will at the same time pass up into the space occupied by the lighter gas."

Speaking of the practical application of dialysis, he refers to it as being five-fold:

"1. For the isolation of chemical substances in a state in which they have not hitherto been obtained by other means.

"2. For the separation of the more active crystallisable constituents of vegetable substances from inert colloidal matter, and the production in this way of a new class of medicines containing the active principles of plants partially purified and in the state ofcombination in which they exist in nature.

"3. For the separation of poisons, such as arsenic, emetic tartar, strychnine, morphine, &c., from organic impurities, such as the contents of a stomach, without the employment of chemical agents.

"4. For the explanation of certain physiological and geological phenomena.

"5. For the elucidation of the normal condition, as to rest or motion, of the ultimate molecules of matter."

Of these we extract elucidations under the third and fourth heads, as more immediately bearing upon our division of science:

"3. The third application of dialysis to be described, is for the separation of poisons from organic impurities in toxicological inquiries. It sometimes happens that it is very important in such inquiries to avoid the use of powerful chemical agents in preparing the suspected substance for the application of tests. Thus, for instance, in testing for arsenic, acids and other chemical agents are usually employed, either to destroy organic matter that would interfere with the application of the tests, or otherwise to eliminate the poison; and it is very difficult, if not impossible, to get these agents themselves perfectly free from arsenic. There may, therefore, be a suspicion that the arsenic was first put in with the chemical agents used, and then detected by the tests that are afterwards applied. This difficulty is perfectly obviated by resorting to dialysis. Arsenious acid and poisonous metallic salts, such as emetic tartar, may be separated from the organic impurities they would be mixed with in the contents of a stomach, or in other parts of the animal body, by means of dialysis, without using any other agent than distilled water, and the solutions thus obtained may be sufficiently pure to admit at once of the application of certain tests.

"We may also get out strychnine, morphine,and other organic poisons in the same way, for these substances all belong to the class of crystalloids which readily diffuse. I have myself obtained these substances by dialysis from the stomach, the flesh, and the blood of animals that have been poisoned, distilled water alone being used for the extraction.

"We thus have three valuable practical applications, of which this new process of dialysis is susceptible. But not only does it enable us to effect important changes in solutions with which we may desire to operate, it also admits of other applications.

"4. Some of the results obtained in operating by dialysis, enable us to explain in a very satisfactory manner certain physiological and geo-

logical phenomena which have hitherto been involved in much obscurity.

"The stomach of an animal is a dialysing apparatus, in which the soluble food is dialysed, and the insoluble food digested under the influence of crystalloids, supplied through the coats of the stomach by diffusion.

"The abundant flow of free hydrochloric acid into the stomach, which occurs during the process of digestion, may be accounted for by referring to the analogous action in the dialysis of the basic chlorides of colloidal substances, such as oxide of iron, alumina, &c. In such cases the acid leaves the colloid and passes in the free state through the septum, and by a similar action hydrochloric acid is probably supplied to the stomach.

"The nutritive constituents of food belong to the class of colloids, which are retained in the stomach while the act of digestion proceeds under the influence of crystalloids that are dialysed into that organ, and then pass on to undergo new changes connected with absorption, assimilation, and excretion.

"The action of medicines must be considerably influenced by the state in which they exist as colloids or as crystalloids. Thus, iron in the state of chloride, sulphate, or other crystalloidal salt, would be diffused through the coats of the stomach, but not so if in the state of a colloid, such as basic chloride, or basic nitrate, in which state it would pass into the intestines, exerting its action probably throughout the entire length of the alimentary canal. Is it not from this difference in their action that some preparations of iron colour the excrements, while others do not?

"It will be important to determine the diffusive power of many preparations used in medicine, as a guide to the physician, and it may be found desirable to devise new preparations, where such are deficient, to represent certain medicinal agents in the colloidal as well as the crystalloidal state.

"Not only the physiologist, but also the geologist, derives important aid from the study of liquid diffusion in the explanation of phenomena occurring in his department of science. The question is often asked, what is the origin of flint and other forms of silica, of oxide of iron, of alumina, and other substances, which, although usually accounted insoluble, are found in nature under circumstances clearly indicating that they have been deposited from solution. This question may be answered by referring to the solutions of all these substances which are obtained by dialysis."

The importance of this mode of analysis can scarcely be questioned; and already, in the hands of men of science, it is developing some important facts, and bids fair to be the means of obtaining a new class of pharmaceutical preparations, occupying an intermediate place between infusions, decoctions, and extracts, and the more pure and certain, but costly active principles of vegetables; nor need it be confined to these.

Extracts from British and Foreign Journals.

VESICATING COLLODIONS.

By Mr. Charles R. C. Tichborne.

Amongst the many epispastics which have been introduced from time to time, cantharides have remained pre-eminent—their certainty, and comparative freedom from pain, being their special commenders. As direct and prolonged contact with the skin is necessary to produce a vesicle, many substances have been in use as an excipient for the application of the vesicant. Some of the preparations in use at present are fluid, whilst others are applied in the form of plaster or ointment. In the first instance, if the desired effect is not produced *instanter*, rubefaction is the only result, an insufficient amount being left upon the surface to produce a blister. Vesicating collodions are preparations which, after evaporation, leave a thick coating upon the cuticle, containing a certain quantity of irritating principle: these may be considered in their actions as intermediate between the fluid and solid preparations, combining, as they do, the properties of both. It is our especial vocation on the present occasion, to take into consideration the construction of a formula for the *Collodium Vesicans*. This preparation, although constantly used by some very extensive practitioners, is far from being generally introduced, which may be accounted for from the circumstance that there is no authorised formula for its preparation, if we except M. Altinger's cantharidal ether and collodion, one to two parts of the latter for children. Each maker has, then, his own formula, which might be excellent, or *vice versâ*, as the case may be. It will be our endeavour to provide a formula which shall have sufficient strength to produce immediate vesication, at the same time having a due regard to the economy of the method. To ensure prompt action, it is not only necessary to introduce a sufficient quantity of blistering material, but it is also requisite that the excipient, or film in which it is applied, should be permeable enough to allow the active principle to transude freely through it. The tough and contractile film left by the ordinary collodion is almost worse than useless, as immediately on drying, the cantharidin at the surface and in direct contact alone exerts any beneficial effect; an ordinary blister might

be applied for any length of time without producing a sensible result, if a dry film of plain collodion be interposed between the blister and the cuticle.

First, then, let us examine the texture of a collodion film, to mark its applicability in the present case. If we pour upon a glass slide some recently prepared collodion, and then examine it by the microscope, it will present the following appearance:—A pretty homogeneous and smooth ground, but running through which are slight ridges, which produce large honeycomb markings. These ridges are caused by the quick evaporation of the ether; the whole is interspersed with filaments of partially disorganized cotton in a semi-gelatinous state. However carefully the cotton may be prepared, it is next to impossible to get rid of these fibres, some portion always escaping the perfect action of the acids. If we can add a small quantity of glacial acetic acid to the collodion, we shall find the character of the film greatly changed. From the slower evaporation the honeycomb ridges are no longer palpable, whilst the solubility is so much increased that the filaments are found to have disappeared. This film is perfectly uniform, but it presents this peculiarity, that it gradually dries into a mass of jelly-like globules, which however possess but little cohesion; when dry, it is very short, for if the finger be run up the glass, instead of leaving it as a tough skin, it collects as a moist crumbled mass. Having so far seen that the glacial acid, besides destroying the contractility, gives it the properties of porosity and slowness in drying, it follows that such a collodion is particularly suited for the application of any vesicant which we may intend to apply, instead of being a varnish which hermetically seals up the active matter. Glacial acetic acid is one of the best direct solvents of cantharidin with which we are acquainted. Pure cantharidin was found to be very soluble in that acid, a saturated solution depositing it unchanged on evaporation in hard mica-like crystals. The principle then that we propose is, to exhaust cantharides by a mixture of ether and acetic acid, and to convert these into a collodion by the addition of gun-cotton.

Take Cantharides, ℥vi;*
Ether from methylated spirits, f℥xiij, or q. s.;
Glacial acetic acid, f℥ij;
Gun cotton, ℥ss;
Methylated spirits of wine, f℥vij, or q. s.

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* Two ounces more cantharides to the above proportions, make a very powerful collodion.

The cantharides, coarsely powdered, are placed loosely into a displacement apparatus, the flow of which can be regulated by a tap; upon this is poured the ether and acetic acid, previously mixed together; after the whole has passed through, it will be found that the *débris* has retained by absorption seven fluid ounces, which must be displaced by the gradual addition of an equal bulk of methylated spirits. If properly done, there is not the least danger of the admixture of the spirits with the percolated menstruum, as the animal substance of the flies swells considerably under the prolonged influence of the spirits of wine, so that the same bulk will be insufficient to quite displace the ether. The ethereal solution should then be made to measure exactly f℥xv, by the addition of a little spirit, and may then be converted into collodion by the addition of the gun-cotton. *Mylabris cichorii*, treated in the same manner, gives even a more powerful vesicant than the cantharides. Those flies, which constituted the blister of the ancients, are, I believe, to be procured in great profusion in India. The percentage of cantharidin is larger in the flies than in the cantharides, but they resemble them in all respects excepting their physical appearance.

The most effectual method of using the collodion is as follows:—The part upon which the vesicle is to be raised should be painted with the vesicant to the desired extent, bearing in mind that the blister produced always extends to about one tenth of an inch beyond the margin of the space covered by the collodion. Care should also be taken that there is a considerable thickness of collodion upon the surface. To ensure this the brush should be passed over and and over again, until about ʒss has been used to the square inch, or less when operating upon a tender epidermis. It is desirable to place a piece of oil silk, or what is still better, a piece of sheet gutta percha two or three inches larger than the surface of the intended blister; the gutta percha is not spoiled, whilst it hastens considerably the action of the collodion.*

In ten minutes or a quarter of an hour, if the cuticle is hard, the collodion should be wiped off with a little cotton-wool moistened with ether, when the blister will almost instantly rise. The principles which advocate the use of the collodion may be enumerated as follows:—Cleanliness, ease

* The action of the gutta percha is easily explained, by its stopping the evaporation of the exhalations of the skin; in this manner the scarf-skin is rendered moist and permeable, the ordinary dry and harsh texture of the skin militating greatly against the production of a vesicle.

in applying to any wrinkled or jointed part, where the ordinary blister would be likely to be displaced, prompt vesication, and safety from strangury. Any of these properties would be sufficient individually to recommend its employment in preference to the other preparations.

Another vesicating collodion may be procured from the volatile oil of mustard, which could be obtained cheaply from the mustard bran. The following formula seems to work well:—

Take Volatile oil of mustard, f℥j;
Collodion, f℥vj;
Acetic acid, gtt. xx.

The acid is still retained in this formula with regard to the texture of the film. But the above collodion is not so good as that made from cantharides or the mylabris, it being more painful and not so certain in its action. For rubefacient purposes these collodions may be diluted with a further amount of collodion, and are then everything that could be desired,—the active principle being in a state of perfect solution. The *Emplastrum Califaciens* of the Dublin Pharmacopœia would be a bad preparation were it not that the process of remelting the *Emplastrum Cantharidis* amongst the pitch literally stews all the virtue out of the fly particles. In conclusion, we may state that our remarks are not built upon our own experience, but from practical applications which these preparations have been subjected to, by competent judges, on an extended scale.

[It is hardly necessary for us to state that the above article, extracted from the *Pharmaceutical Journal*, refers to the human subject. But there is much that is suggestive in it, and which by alteration might be made applicable to veterinary practice.]

ACETIC ACID AS A SOLVENT OF CANTHARIDINE.

At a recently held Meeting of the Pharmaceutical Society, the President, Mr. P. Squire, remarked that it had been shown by experiments made some time ago, that acetic acid was not a good solvent of cantharidine.

Dr. Redwood said such was the case with weak acetic acid, but not with the strongest acid.

Mr. Deane observed that Pharmaceutists had for many years been under a misapprehension with regard to the use

of acetic acid as a solvent for Cantharidine. In the Pharmacopœia of 1836, a process was given for the preparation of *Acetum Cantharidis,* in which acetic acid containing 30·8 per cent. of real acid was ordered; and he believed when acid of that strength was used, the vesicating principle of the cantharides was taken up so as to render the preparation efficacious; but it happened unfortunately that one of the largest makers of acetic acids as supplied for use in pharmacy, had misunderstood the intention of the College, and was for many years supplying an acid of less strength than that ordered, which caused the *Acetum Cantharidis* when made with such acid to be inefficacious. He had some time ago fully investigated this subject, and caused the defect alluded to to be remedied.

The Chairman said, he recollected many years ago, when the vesicating power of *Acetum Cantharidis* of the Pharmacopœia was found to be deficient, a very efficient and powerful preparation was made by substituting glacial acetic acid for the acid of the Pharmacopœia.

Mr. Attfield stated, that in making some experiments with bromacetic acid, he had observed that it acted as a powerful vesicant, and he thought it might be worth while to try whether it presented advantages over other vesicants.

THE POISONOUS EFFECTS OF CARBONIC OXIDE.

By H. Letheby, M.B., M.A., Ph.D., &c. Professor of Chemistry and Toxicology in the Medical College of the London Hospital.

A good deal of misapprehension seems to prevail respecting the poisonous action of carbonic oxide. On the one hand, accidents have somewhat recently occurred where in all probability the effects of the gas were entirely overlooked; and on the other, fatal consequences have been unjustly attributed to it. Some of this confusion is due to the circumstance that our standard works on poisons and medical jurisprudence, have either omitted the subject entirely, or have discussed it in very meagre language. The recent catastrophe at the Hartley colliery, and the remarks which have been published respecting the supposed influence of the gas in causing the death of the men, have created an opportunity for a re-examination of this question.

Carbonic oxide was discovered by Priestley long before the

close of the last century; and in 1802, Clement and Desormes, at the instance of Guyton Morveau, undertook a careful examination of its properties. They not only proved its chemical nature, but they also ascertained that it was a poisonous gas. Birds put into it dropped dead before they could be taken out; and when the experimenters themselves attempted to breathe it, they were attacked with giddiness and faintness. This experiment was repeated by Sir Humphrey Davy in 1810, who says that when he took three inspirations of it, mixed with about one fourth of common air, the effect was a temporary loss of sensation, which was succeeded by giddiness, sickness, acute pains in different parts of the body, and extreme debility; some days elapsed before he entirely recovered. It is, he says, fatal to animal life.

About the same time, the researches of Nysten demonstrated that the gas was capable of producing great disturbance of the system when injected into the veins; and although he concluded that the effects were of a mechanical nature, yet the accounts which he has given prove that the gas is a dangerous poison.

Later still, in 1814, the two assistants of Mr. Higgins, of Dublin, made experiments with it upon themselves, and in one case, that of Mr. Wilter, with almost a fatal result. Having exhausted the lungs of air, he inhaled the pure gas three or four times, and was suddenly deprived of sense and volition; he fell upon the floor, and continued in a state of perfect insensibility, resembling apoplexy, and with a pulse nearly extinct. Various restorative means were employed, but without success, until they resorted to the use of oxygen, which was forced into his lungs, and then his life was restored; but he was affected with convulsive agitation of the body for the rest of the day. He suffered also from violent headache, stupor, and a quick, irregular pulse. Even after mental recovery he suffered from giddiness, blindness, nausea, alternate heats and chills, and irresistible sleep. The other gentleman, after inhaling the gas two or three times, was seized with giddiness, tremor, and incipient insensibility. These effects were followed by languor, weakness, and headache of some hours' duration.

Since those experiments were made, others of a more extended character were instituted by Tourdes and by Leblanc. Tourdes found that rabbits were killed in seven minutes when they were put into a mixture of one part of the gas with seven of atmospheric air. A fifteenth part of the gas in common air killed them in twenty-three minutes. Leblanc's experiments were made in conjunction with Dumas, and he ascer-

tained that one per cent. of the gas in atmospheric air would kill a small dog in a minute and a-half, and that birds were killed immediately in a mixture containing five per cent. of it.

Very recently I have myself ascertained that air containing only 0·5 per cent. of the gas will kill small birds in about three minutes; and that a mixture containing one per cent. of the gas will kill in about half this time. An atmosphere having two per cent. of the gas will render a guinea-pig insensible in two minutes; and in all these cases the effects are the same. The animals show no sign of pain; they fall insensible, and either die at once with a slight flutter,—hardly amounting to convulsion,—or they gradually sleep away as if in profound coma. The post-mortem appearances are not very striking: the blood is a little redder than usual, the auricles are somewhat gorged with blood, and the brain is a little congested. In birds there is nearly always effusion of blood in the brain, and it may be seen through the transparent calvaria by merely stripping off the scalp after death.

Accident has also demonstrated how injurious the gas is even to the human subject. For many years past attempts have been made to promote the use of water-gas as an agent of illumination. The gas sometimes contains as much as thirty-four per cent. of carbonic oxide. It is obtained by passing steam over red-hot charcoal; and as the steam is decomposed by the ignited carbon, the hydrogen is set free, and carbonic oxide, with carbonic acid, is produced. Patents for this process of manufacturing gas date as far back as the year 1810, and they have at various times been put into operation in this country and on the Continent. Sellique, in 1840, obtained permission to use the gas in the towns of Dijon, Strasburg, Antwerp, and two of the faubourgs of Paris and Lyons. At Strasburg an accident occurred which put a stop to its use. The gas escaped from the pipes into a baker's shop, and was fatal to several persons; and not long after an aëronaut, named Delcourt, incautiously used the gas for inflating his balloon. He was made insensible in the car, and those who approached the balloon to give him assistance fainted and fell likewise. The use of the gas has, therefore, been interdicted on the Continent.

Another source of danger from it is in the combustion of carbon. It is found in the neighbourhood of brick-kilns and furnaces. The gases discharged from the latter contain it in large proportion. Iron furnaces produce it to the extent of from twenty-five to thirty-two per cent., and copper furnaces from thirteen to nineteen per cent. In the year 1846, M. Adrien Chenol was anxious to ascertain the properties of the

gases yielded by his process of smelting zinc ores with carbon, and not having a suitable instrument for collecting the gases, he attempted to draw them out of the furnace by means of a pipette. Some of the gas was thus inhaled, and he fell immediately, as if he had been stunned; the eyes were turned back in the orbits, the skin was discoloured, the veins were swollen, and presented a black tint under the skin; there were violent pains in the chest, and the brain felt powerfully oppressed. After removal to the open air, and the application of restoratives, sensibility gradually returned, but the internal pains were still severe, and there was a feeling of suffocation. For several days he felt depressed and languid; the digestion was bad; sleep was obstinate and heavy, and it was frequently disturbed by cramps in the knees and toes. Even for months afterwards there was a morbidly excited state of the nervous system.

In a more diluted condition the gas is still able to exert an injurious action, and it is very probable that the singular catastrophe which happened at Clayton Moor, near Whitehaven, in the summer of 1857, was caused by the diffusion into the air of carbonic oxide from the neighbouring iron furnaces. There is a row of cottages near to these furnaces where, in the month of June, 1857, a number of persons were suddenly seized with insensibility, which soon passed, in some cases, into coma and death. About thirty persons were thus attacked, and six of them died. The effects were attributed at the time to the escape of sulphuretted hydrogen from the slag on which the cottages were built; but it is more probable they were caused by the oxide of carbon from the furnaces.

Lastly, it is worthy of remark that very recently Boussingault has noticed that the leaves of aquatic plants give off carbonic oxide and marsh gas when under the influence of solar light; and he asks whether this gas so produced may not be concerned in the unhealthiness of marsh districts.

A more complete acquaintance with the effects of this poison is a great desideratum, although enough is known to indicate its general mode of action, and to furnish evidence for its discovery.—*Lancet.*

ADULTERATION OF BUTTER.

Mr. John Horsley, analyst to the county of Gloucester, in an article in the *Chemical News,* recommends as a method to distinguish between pure butter, and that adulterated with lard and other substances, the following process:

First satisfy yourself, by melting a portion of the suspected butter over a water-bath, and observing if there be any insoluble admixture of farinaceous matter, such as wheat-flour, potato-starch, arrowroot, or turmeric (said to be sometimes used), which the microscope and chemical tests will prove; then mix the melted butter in an evaporating-dish with four or five times its bulk of hot water, and allow it to stand for two or three hours to collect on the surface and solidify. Detach the resulting cake of butter, and place it on a piece of blotting-paper to dry, by the absorption of all adhering aqueous matter. If a piece of this prepared butter be introduced into a wide-mouth stoppered bottle, and surrounded with ether, at the temperature of 65° Fahr., it ought to entirely dissolve, forming a clear lemon-yellow coloured liquid.

On the other hand, the purest lard, which, on being melted, leaves no residue, is more or less insoluble in ether at that temperature, as a thick milky fluid results, which, on standing, deposits to a considerable extent. The same may be said of other fats, such as dripping, mutton suet, tallow, &c., the precipitates from which are of a much coarser and flocculent character than that from lard in ether. Hence, we perceive there is a striking peculiarity about butter, which, if treated as above, enables us to readily determine its purity and the probable proportion of foreign fatty matters mixed with it. The solution of lard and other fats in ether is considerably influenced by temperature, for if the bottle containing them be held in the hand a short time liquefaction takes place, but on a reduction of temperature they are again precipitated. The character also of the various precipitates is remarkable, and gives us some clue to their nature,—the precipitate from lard being very fine and smooth, whilst that of dripping is granular and crystalline, and that from tallow long and thread-like, lying piled up one above the other. A solution of butter in ether, exposed to a less temperature than stated, yields beautiful stellar-like tufts of very fine acicular crystals.

Dr. E. Ballard, parochial analyst, Islington, &c., considers the above process as a somewhat expensive one, and therefore not likely to be of much practical use. He gives the following as "tests cheaper and more readily applied."

The most frequent adulterating fat by far is that of beef. We may call it beef "dripping" if we will, dripping being the form in which the fat I refer to is best known. That such is the case may be seen by any one who will collect at 65° the residue of solution by ether and melt it in a watch-glass. It will, on cooling, be seen to possess the physical characters of beef-dripping, with the exception of the odour and taste, both of which are wanting. These characters are, a dull, yellowish colour, granular texture, but less so than mutton dripping, melting slowly on the tongue, with a granular feel when the tongue is moved upon it. Its consistence is firm, and when the mass is broken by a spatula, the granulations do not separate like those of mutton, and its consistence is more waxy. Mutton dripping is white.

The simple distinguishing character between pure butter and butter adulterated with beef dripping, may be noticed in the following particulars:—Its colour, consistence, odour, the appearance on washing with hot water, the occurrences on drying on blotting-paper, the physical characters when dried, and the results on pressure of the dried mass. To render these observations more precise in statement, I will

give them in parallel columns, the adulteration of the butter for this purpose being supposed to be in equal proportions of butter and beef dripping.

Butter, newly churned and free from Salt.	*Butter adulterated with Dripping.*
Colour. — Bright yellow — uniform.	Paler—(paleness increases with the proportion of dripping)—often marbled yellow and white.
Consistence.—Firm at 54°.	Firmer (increasing with proportion of dripping).
Odour.—Strongly butyraceous.	Butyraceous odour lessened (but still present even in large amounts of adulteration).
Appearance on washing, in a glass half-a-pint beaker, one ounce with boiling water.—A melted layer occurs on the surface, consisting, as viewed at the side of the beaker, of minute drops, which, lying closely together, give a finely cellular aspect to the layer. When cool, the cake is a soft solid, fluctuating on agitation of the glass, or, at any rate, yielding readily when the glass is tilted. The water below is very opaque with milkiness. The cake is yellow.	The melted layer consists of much larger drops, and the cellular appearance therefore larger. On cooling, the cake is firmer, paler in colour, sometimes marbled, does not yield at all or much less readily to tilting of the beaker. The water below is less opaque with milkiness (and often deposits dirt from the salt used in preparation).
On transference to blotting-paper.—The mass is wet, and the wet runs away slowly.	The mass is almost dry on removal from water, and the remaining water rapidly runs away into the paper.
The blotting-paper acquires a marked yellow, greasy stain, which runs extensively over it. On transferring the butter to a second fold of paper, this stain is again imparted.	The stain to first blotting-paper is less marked, and that to second also. Both are of a less deep tint.
Physical characters of dried Butter.—Colour, bright yellow—odour, butyraceous—breaks under pressure of the spatula at 54° into fine mealiness—taste, butyraceous, not melting on tongue so smoothly as unwashed butter, but still quickly, and with little sense of granulation.	Colour less yellow—odour, that of dripping, but more or less butyraceous (this varying with the relative proportions of the two)—has a coarsely granular appearance in mass, and on gentle pressure with a spatula at 54°, breaks down into independent granules very readily, these being the size of fine pearl sago and globular in shape—taste of the dripping distinctly perceptible (in low degrees of adulteration this is less marked)—does not melt so smoothly or readily on the tongue, but for a long time a roughness remains upon it, *increasing as it melts.*
Pressure of a little heap the size of a pea firmly and quickly by a	The stain is a circular, well-defined, oily spot, which soon be-

spatula between a fold of blotting-paper gives an irregular, ill-defined, greasy stain, not very marked.

comes surrounded by a less greasy halo. (The perfection of this stain appears to vary with the quantity of the adulterant.)

These tests are such as may be readily applied by a wholesale or retail purchaser. These are by no means all the signs easily applicable for distinguishing this form of adulteration. Should the present paper receive insertion and be acceptable to your readers, I shall be happy to furnish others which have resulted from my investigations on this subject. It is one especially interesting to me, since it is believed that at Belle Isle—a nest of nuisance factories in my parish—the material for the adulteration of butter is manufactured to a great extent for exportation. The "fresh" butters are those chiefly and to the greatest amount adulterated with this fat.

Mr. Horsley in reply, says the expense connected with his process is a matter of assumption merely, since a teaspoonful of ether is amply sufficient for an experiment.—*Chemical News.*

FORMATION OF NEW VOLATILE ALKALOIDS DURING PUTREFACTION.

By F. Calvert, F.R.S., &c.

We have previously, under the head "Products of Sloughing Wounds," stated the fact that Dr. Calvert believed the compounds thus formed to differ from those generally supposed, drawing his inferences from decomposing organic matters. The method adopted by him he has communicated to the *Royal Society* as follows:

Into each of a number of small barrels twenty lbs. of meat and fish were introduced, and, to prevent the clotting together of the mass, it was mixed layer by layer with pumice-stone. The top of each barrel was perforated in two places, one hole being for the purpose of admitting air, whilst through the other a tube was passed which reached to the bottom of the barrel. This tube was put in connexion with two bottles containing chloride of platinum, and these in their turn connected with an aspirator. By this arrangement air was made to circulate through the casks, so as to become charged with the products of putrefaction, and to convey them to the platinum salt. A yellow amorphous precipitate soon appeared, which was collected, washed with water and alcohol, and dried. This precipitate was found to contain C, H, and N, but, what is highly remarkable, sulphur and phosphorus enter into its

composition. The presence of C, H, and N was ascertained by elementary analysis; for the sulphur and phosphorus, a given weight of the platinum salt, 0·547 grm. was oxidised with nitric acid, and gave 0·458 grm. of sulphate of baryta =11 per cent. of sulphur, and 0·266 of pyrophosphate of magnesia = 6·01 per cent. of phosphorus. I also ascertained the presence of these two substances by heating a certain quantity of the platinum salt with strong caustic ley, when a liquid volatile and inflammable alkaloid was obtained, whilst the sulphur and phosphorus remained combined with the alkali, and were easily detected. I satisfied myself during these researches, which have lasted more than twelve months, that no sulphuretted nor phosphuretted hydrogen was given off; and my researches, as far as they have proceeded, tend to prove that the noxious vapours given off during putrefaction contain the N, S, and Ph of the animal substance, and that these elements are not liberated in the simple form of ammonia and sulphuretted and phosphuretted hydrogen. I also remarked during this investigation that as putrefaction proceeds different volatile bodies are given off.

Dr. Calvert considers that the completion of these researches will occupy several years.

THE FORMATION OF MINERALS, CLAYS, LIMESTONE, ROCKS, &c., BY WATER IN ITS CIRCULATION THROUGH THE EARTH.

By Professor Ansted, M.A., F.R.S.

We speak of the grave as silent—we think of the ground and the rock as permanent, and almost as if they were eternal. We cannot feel that all beneath our feet is changing, and that there is a kind of life even in dead matter. We cannot see it, but a circulation really goes on in all material substances, and it is consistent with apparent and external repose; for if we examine and carefully describe an object or a state of matter at one time, and afterwards—after a sufficient interval, repeat our investigation, we may find perhaps the same form but a different substance: there may be the same appearance, but there is a new and changed texture.

Nature indeed knows no repose. The minute atoms of which solids are formed, however compactly placed they may seem, are removed from each other by a distance which is large in proportion to their size—large enough at any rate to

admit of any amount of motion amongst themselves, large enough to let atoms of other matter circulate amongst and replace them; large enough to allow the combined atoms of hydrogen and oxygen as water to penetrate them.

The mud deposited to-day at the mouth of the Rhine, the Ganges, or the Mississippi, is a mechanical mixture of lime and clay and water with grains of sand, fragments of wood and bone, marine and fresh water shells, particles of iron oxide, and the infinity of miscellanea that cannot fail to be brought together by fresh water running over a surface of land which is covered with vegetation and with animal life, and ultimately terminating its course and depositing its load where it meets the tidal wave of salt water.

This mud deposited to-day will be buried to-morrow, and in the course of centuries will be covered up thickly, and remain permanently buried for a long time.

What then will happen? Do you suppose all will remain quiet? Do you suppose that having entered nature's great laboratory these materials will be left idle? Banish such a notion from your minds, and listen to what really will take place.

First, decomposition commences, or advances if it had already commenced, in the organic matter. Gases will be evolved, these will affect the other compounds otherwise permanent; elective affinities will be called into play, and a general re-arrangement take place of all the particles until they attain a first state of temporary equilibrium. During all this time they are saturated with water, a heavy column of water presses upon them, and their temperature is more or less equable in proportion to the depth of the deposit.

By degrees the water gets to a certain extent squeezed out of them, and they become solid instead of pulpy. The attraction of cohesion acts, and at last the wet pulpy mud either becomes changed into tough clay, or a sort of half-formed limestone is formed, or the mass remains loose sand.

Then come into play certain movements of the earth's surface. The ground sinks, the deposit continues, and at length the former mud becomes exposed at a steady, even temperature of some 200° or 300°, under great pressure of earth and water, to those magnetic currents which circulate through the earth. Then begins a fresh series of changes, crystallization starting at some atom of foreign matter. Some mud passes into tough clay, the lime-mud passes into beds of limestone, impurities and foreign substances accumulate together in bands, the shells become crystalline, and all are cemented together; undecomposed wood tends to

become coal, silica takes the place of some of the organic matter; the sulphur and phosphorus, set free from animal matter, enter into new combinations; the mass in drying contracts irregularly, and is full of cracks and fissures, and in these water circulates, being forced through at a temperature corresponding to the depth. As it circulates, it carries with it, from place to place, various minerals; removing them from one point and leaving them behind at others, according to the nature of the chemical operations going on.

After a time the beds sink lower, the clays become subject to greater pressure, the limestones get compact and pass into marble; the metals combined with oxygen or sulphur group themselves together in cavities with other minerals earthy and crystalline.

One step more—elevation begins. The clays are now subjected to the pressure from below as well as above, and under this double squeeze they become twisted and bent like pieces of cloth, and they also assume a new lamination. They become slates. Some of the sandstones have become by this time converted into quartzite, and the limestone has completed its crystallization. When elevation comes these hard beds, being brittle, are broken, leaving large open spaces and great cavities beneath the surface. Here also water collects.

Yet again. Far down, at a depth of tens of thousands of yards, and therefore under great pressure, water, in company with the minerals which form granite, accumulates in a mixed mass, and a slow but incessant crystallization goes on amongst them, in which the water is entangled with the other minerals, and helps to form a part of the substance of each crystal.

But in all this there is no melting such as we have in volcanic rocks. In these latter water is not present in the same way; they were formed much nearer the surface; and they belong to a different class of phenomena. Their origin is detected by the absence of water in them.

Wherever great change has taken place at great depth—wherever is seen the rich variety of minerals and the valuable supply of metals,—there water has acted.

Water carried down in the rocks that descend is worked up into new forms, and is only returned to the surface when it has done its work and when other supplies from above have replaced it.

And in time the rocks thus elaborated rise again—some at small depth will have been little altered, and with their

original water will form gravel, and surface clay, and sand or soft limestone:—some, deeper and more altered, will show the effect of chemical action by unmistakeable chemical and atomic change, while the wealth of fossil organic remains still present, sufficiently speaks of their mechanical origin: others again, much deeper, will have been so completely altered as to have lost all trace of this life origin. It does not the less follow that they have once contained fossils as distinct and as numerous as in any recent deposit.

As each rock comes again within the influence of surface disturbance, it will be again worn away by the river, or beaten into fragments by the tidal wave; water will once more destroy what water originally formed, what water afterwards modified, and what will once more be converted into a deposit at the bottom of the ocean, the grand reservoir of the same ever present, ever active element.

In all the great circle of changes concerning which geology informs us, water is then the chief agent. Heat and chemical action of themselves can do little, and certainly could not produce what is needed for our world. They act with and by water, and thus produce their results.

Abstract this important form of matter and consider what the result would be. The great ocean would be but a salt desert without an oasis, the land a dry parched rock; there would be no life, animal or vegetable, not even the smallest animalcule or the red lichen on the snow. The sky would be without cloud, and the thermic and magnetic currents would cease to vivify the dry bones that would then form but a skeleton of the earth.

Water is the life of the earth as blood is the life of man. This is a wonderful and instructive analogy, and one which may lead to many useful suggestions in the contemplation of nature.—*Condensed from the Chemical News.*

ON THE COLOUR-TESTS FOR STRYCHNIA, AND THE DIAGNOSIS OF THE ALKALOIDS.

Being the substance of part of the Croonian Lectures for 1861, *delivered at the Royal College of Physicians.*

By William A. Guy, M.B. Cantab., Fellow of the College and Professor of Forensic Medicine, King's College, London.

(*Continued from p.* 242.)

Assuming the description just given to be correct, I now proceed to inquire whether there are any known substances

which give rise to a similar reaction. The answer must be, in a qualified sense, in the affirmative; but it must be understood that the reaction is only *similar*, not the *same*.

Such a substance is to be found in cod-liver oil, which, when treated with strong sulphuric acid, assumes a purple tint, mixed with streaks of blue, changing after a time to mulberry, and from that to a red-brown. In these changes of colour there is such a general resemblance to the strychnia tints as would justify their being put forward as an objection to the colour-tests, but for the very obvious consideration that with sulphuric acid alone strychnia undergoes no change of colour. The very fact, too, that cod-liver oil is an oil, while strychnia is tested either as an alkaloid or the salt of an alkaloid, as a crystal or as a white powder, or as a dry deposit from a liquid holding it in solution, deprives this objection to the colour-tests for strychnia of all practical value.

Again, aniline is mentioned as a source of fallacy. But aniline is a coloured liquid, which yields with sulphuric acid a dense white precipitate, the sulphate of aniline. Strychnia, on the other hand, is a crystal or white powder, or a dry deposit from a liquid holding it in solution.

But the sulphate of aniline which is formed by adding the strong sulphuric acid to the liquid aniline, is sold as a white powder, as are some specimens of strychnia. Hence the sulphate of aniline might possibly prove a source of fallacy, inasmuch as it gives no change of colour with sulphuric acid, and yet when treated with the colour-producing substances, yields a colour similar to the blue of strychnia . But the sulphate of aniline, in place of a rich deep blue passing speedily into mulberry and at length into bright red, assumes at first a pale green, which deepens by slow degrees, then passes into a beautiful blue, continuing unchanged for a long period, but at length turning to a black. So that the first characteristic colour with strychnia is the second with aniline, and the transient colour with strychnia is persistent with aniline.

Again, there is a red crystalline substance, pyroxanthine, which produces with sulphuric acid alone, without addition of the colour-producing tests, a blue similar to that produced by strychnia. But there is here no real fallacy, because strychnia is not coloured, and does not yield any colour with sulphuric acid alone.

Nor do papaverine and narceine, which are tinged purple by sulphuric acid alone, create any difficulty, or occasion any fallacy. And the same may be said of the whole body of

alkaloids and active principles, whether coloured or colourless, which yield colours when treated with sulphuric acid alone. Of those which resemble strychnia in giving no colour with sulphuric acid, it may be stated with equal confidence, that not one of them yields with the colour-developing substances the true strychnia colours, or any colours resembling them.

The foregoing are given as examples of the sort of objections that are urged against the colour-tests for strychnia. They belong to the class of objections which no one out of a court of law would bring forward as worthy of serious attention. They are based, not so much on a misapprehension of the facts, as on an illogical comparison of dissimilar phenomena. But there is one objection founded on a misapprehension and quite unintentional misrepresentation, which ought not to be passed over in silence. It is stated by Dr. Taylor, in his work on Poisons, that the alkaloid curarina obtained from the South American poison curara "resembles strychnia in the action of the colour-tests, brucia in the action of nitric acid, and both in its intense bitterness." These are the words used by Dr. Taylor, at p. 786 of the second edition of his work; and on referring to p. 772, he says of the same alkaloid, that "strong nitric acid produces with it a blood-red colour; sulphuric acid gives with it a rich carmine tint, in which characters it resembles brucia," and further that Pelikan found pure curarina to possess the chemical properties of strychnia, so far as the colour-tests are concerned, and with more constant results. Thus sulphuric acid when conjoined with the action of chromate of potash, ferricyanide of potassium, or peroxide of lead, "produced a beautiful play of colours," and that "the galvanic test acted similarly." Now, on referring to the passage cited from Pelikan, I find that this beautiful play of colours is a translation of the words "des colorations rouges très belles," and "la coloration rouge," the one expression being applied to the chemical tests, the other to the galvanic test. So that the alkaloid curarina is set up as a fallacy on the strength of its yielding with the colour-tests (sulphuric acid mixed with chromate of potash, ferricyanide of potassium, or peroxide of lead) a brilliant red colour, or colours, instead of the beautiful play of colours, blue, mulberry, and red, which jointly, and not separately, characterise strychnia. If any one colour is to be deemed the strychnia colour *par excellence*, it is the rich, deep blue, and not the brilliant red. Let it also be remembered that sulphuric acid gives with curarina, according to Bernard, a rich carmine tint, while strychnia undergoes no

change of colour when treated with sulphuric acid. The statement made by Dr. Taylor that in giving a blood-red colour with strong nitric acid and a rich carmine tint with sulphuric acid, curarina resembles brucia, is evidently founded in error. The reaction of brucia with nitric acid is correctly stated, but brucia certainly does not yield a carmine tint with sulphuric acid. It is one of the list of substances grouped together in my tables as characterised by a negative action with sulphuric acid; and Mr. Jenkins, in the table which I sent round in my last lecture, attributes to it a negative reaction with sulphuric acid (see *Chemical News*, Oct. 6, 1860); and here I may observe that it is one of the obvious advantages of tables such as these, that they place before us the common and familiar reactions of the substances which they comprise, in such an orderly and methodical way as greatly to assist the memory, and to guard against such inadvertent statements as this of Dr. Taylor's respecting brucia.*

On referring to the tests for brucia itself, as given at page 801 of Dr. Taylor's work on Poisons from which I have been quoting, I find it stated that "strong sulphuric acid colours brucia of a rich rose-pink colour." This colour differs widely from the rich carmine (*belle teinte carminée*) of Bernard, said by Dr. Taylor to be characteristic of the same reaction, and I think that I may venture to state of it that it is not the reaction of pure brucia with pure sulphuric acid. Indeed, it is not the reaction of specimens of brucia of ordinary purity with specimens of sulphuric acid of similar purity. To obtain a rich rose-pink with brucia, we must use a specimen of sulphuric acid containing an unusual quantity of nitric acid, and I have no doubt that the unintentional use of such an acid gave rise to this misapprehension. I may add, that to specimens of brucia of fair average quality, sulphuric acid will impart a very slight tint (rose-colour or buff), and a still slighter tint to the solution of the alkaloid in the acid. But a rich rose-pink colour is an evidence of the presence of nitric acid, and is readily developed in the solution of the alkaloid in sulphuric acid by a short exposure to the vapour of nitric acid.

I could not have accomplished the object I have in view of vindicating the colour-tests for strychnia from unfounded objections, without tracing this particular objection to its true source. It was necessary to show that the reactions of the rare alkaloid, *curarina*, differ essentially from those of strychnia, and of brucia, which is associated with strychnine in more than one of the plants that yield it; and I could not

* These tables will be referred to more particularly in my next paper.

do this without showing that an esteemed medico-legal authority had made a mistake in reference to a reaction, and an oversight in rendering the words of a French author.

I may add, that on comparing the extract of nux vomica with a specimen of curara poison, for which I am indebted to the kindness of Mr. Morson, and with the brown powder scraped from an arrow tipped with the same poison, and forming one of a collection kindly presented to me by Mr. Stone, of the College of Surgeons, I find no resemblance between the one extract and the other, except in the property of intense bitterness. The woorara poison imparts to strong sulphuric acid a greenish-brown tint, and the nux vomica a pink colour; while strong nitric acid, which turns the first to a pale, dirty yellow, changes the second to a very distinct orange colour. The addition to the solution in sulphuric acid of bichromate of potash produces less effect on the colour of the curara than takes place with the extract of nux vomica. If the woorara really contained any alkaloid capable of developing with sulphuric and nitric acids the deep rich colours attributed to it, I think that some approach to those colours might be expected in the extract itself.

I may conclude this part of my subject by expressing my firm conviction that to the colour-tests applied in the manner I have recommended, there is no valid logical objection; and that though a negative result is not conclusive of the absence of strychnia, a positive result (by which I must be understood to mean the development of a rich blue colour on stirring the colour-developing substances into a spot first treated with sulphuric acid without change of colour, the rich blue colour in question passing, after a few seconds, into other colours) affords undeniable proof of its presence.

In my next, and last communication, I shall endeavour to discriminate the principal alkaloids from each other, and to represent the differences between them by convenient tabular forms.

(*To be continued.*)

ON THE SCOURING LANDS OF CENTRAL SOMERSET.

By Dr. Augustus Voelcker, Royal Agricultural College, Cirencester.

(From the *Bath and West of England Agricultural Journal.*)

(*Continued from p.* 308.)

Examination of the Herbage Theories.

According to the botanical theory, the "tartness" of land is caused by one or more particular species of medicinal plants, which are supposed to grow in abundance on scouring pastures, and are not found in sweet and sound meadows.

The purging flax (*Linum catharticum*) has been specially named as the cause of the complaint, but there is no evidence whatever to prove that this plant really abounds in scouring pastures. On the occasion of my visit. I carefully looked out for the *Linum catharticum*, but could not find a single specimen in one of the worst scouring pastures—the parish of Cossington. Singularly enough, on my return home, I found the purging-flax near Tetbury-road Station, on a poor piece of pasture, resting on a Bradford-clay subsoil, but I never heard that this land scours cattle.

Carnation-grass is another plant to which the evil is attributed, but as this grass grows quite as abundantly in sound pastures as in scouring meadows, in which latter sometimes hardly a specimen can be found, the origin of the disease cannot be traced to carnation-grass.

Nor can it be referred to the common sorrel (*Rumex acetosa*), the dandelion (*Leontodon taraxacum*), or to meadow-saffron (*Colchicum autumnale*); for the first-named plants are often found in abundance in meadows that do not scour, and on the other hand there are many scouring pastures in which not a single specimen of meadow-saffron occurs.

The botanical theory, in short, is unsupported by any reliable evidence, and even should it be found that in a particular locality the disorder can be traced distinctly to the prevalence of purging-flax or *colchicum* in the pasture, there is abundant practical evidence to prove that this would be quite an exceptional case, and that in the great majority of scouring pastures the origin of the evil must be sought elsewhere.

According to others, the poor character of the herbage of scouring pastures is the real cause of the mischief. Those

who describe the character of the herbage as poor, I imagine, use this adjective as descriptive of a thin, wiry, stunted growth, such as may be observed on thin and infertile soils. They cannot mean "poor" to signify the same as innutritious; for, on the one hand, the poorest herbage may be and often is very nutritious, and on the other hand the most luxuriant grass-crops—as for instance, the hay from water-meadows—is by no means so nutritious as hay from common meadows. There would moreover be no other meaning in the expression—"the herbage of certain pastures scours cattle because it is innutritious"—than is conveyed in the bare statement of a well-known fact.

Everybody knows that the herbage of scouring pastures is innutritious; if it were not so it would not scour. The question is, why is it innutritious? Is it the want of a proper supply of organic and mineral constituents in the soil, which has the effect of producing a stunted, thin, and wiry herbage, supposed to be innutritious? This question may be answered decidedly in the negative. If, in consequence of a deficiency or total want of certain substances which are food to plants, scouring land produced, as is supposed, a herbage deficient in the proper elements of nutrition, the application of manures would remedy the evil, but experience teaches that the use of manures aggravates the mischief, instead of abating or curing it.

But it is hardly necessary to bring forward other evidence to show that this theory can only exist in the minds of those who are practically unacquainted with the subject. It ill accords with well-known facts.

The herbage on peat-land is proverbially poor, and yet it does not scour. On the other hand, some of the worst scouring meadows produce a herbage to all appearance as luxuriant and succulent as can be desired. Indeed the more luxuriant pastures, in the districts where scouring amongst cattle prevails, are generally a great deal worse in this respect than poorer and less productive fields. However, no man, I believe, be he ever so well acquainted with the subject, by merely inspecting a field, can positively say whether it scours or not. There is nothing peculiar in the appearance of the herbage that distinguishes it from sound pastures, and yet, I imagine, there must be an essential difference between sweet and wholesome grass and that from scouring pastures. In most cases, I believe, the herbage must be regarded as the more direct cause of the complaint. For this reason my attention was specially directed to the study of the chemical characters which belong to sound and scouring herbage. At

the same time I have endeavoured to investigate some peculiarities of scouring land, which I have every reason to believe tend to produce immature, abnormally constituted, and on this account unwholesome herbage.

The hay from scouring pastures, when made rather green, appears to possess the same injurious properties which distinguish the grass. But when made less green and rather late in the season, it appears either to be entirely freed from any injurious properties, or to produce scouring in a very slight degree. It is important to bear in mind that hay from the same unwholesome meadow, according to the condition in which it is made, affects cattle very differently.

I should have liked to examine the herbage from scouring and wholesome pastures at various stages of growth, but had no opportunity to undertake a series of analytical examinations of the green produce, and was therefore obliged to confine my examinations to hay from sound and from scouring pastures.

Sample No. 1.—*Hay from Scouring Land on Mr. Rugg's Farm, Cossington.*

Dried at 212° F., 100 parts of this hay gave—
8·94 parts of mineral matter, or ash

In the same condition 100 parts were found to contain—
1·707 per cent. of nitrogen, which is equivalent to
10·668 per cent. of nitrogenised compounds.

Sample No. 2.—*Hay from Peat Land at Meare, which does not scour.*

In a perfectly dry state this hay gave on burning—
7·11 per cent. of ash in one determination, and
7·14 per cent. of ash in a second determination.

A considerable quantity was next reduced to ash, which was submitted to a full analysis, when the following results were obtained:

Composition of the Ash of Hay from Peaty Land at Meare, which does not scour.

Lime	12·05
Magnesia	3·27
Oxides of iron	·33
Potash	21·36
Chloride of potassium	8·03
Chloride of sodium	9·08
Phosphoric acid	4·61
Sulphuric acid	4·36
Silica	37·34
	100·43

Dried at 212° F., 100 parts of the same hay furnished—

1·414 per cent. of nitrogen, which is equal to
8·837 per cent. of nitrogenised compounds.

Sample No. 3.—Hay from Scouring Land at Meare.

In a perfectly dry state this hay produced in burning—

10·24 per cent. of ash in one experiment, and
10·38 per cent. of ash in another.

The ash was next submitted to a complete analysis, which furnished the subjoined results :

Composition of the Ash of Hay from Scouring Land at Meare.

Lime	12·31
Magnesia	2·71
Oxide of iron	·89
Potash	17·47
Chloride of potassium	26·01
Chloride of sodium	1·70
Phosphoric acid	6·42
Sulphuric acid	3·76
Silica	27·22
Carbonic acid and loss	1·51
	100·00

Dried at 212° F., 100 parts of hay, No. 3, were found to contain—

1·782 per cent. of nitrogen, which is equivalent to
11·137 per cent. of nitrogenized compounds.

Simple, No. 4.—Hay from Peat-Land at Meare, earthed over with Scouring Land. Hay scours.

100 parts of this hay in a perfectly dry state furnished—

8·76 per cent. of ash, and
2·354 per cent. of nitrogen, which is equal to
14·712 per cent. of nitrogenised compounds.

(*To be continued.*)

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Annales de Médecine Vétérinaires, April, 1862.

BLENNORRHAGIC OPHTHALMIA IN THE DOG.

By M. Guilmot, Médecine Vétérinaire du Gouvernement, &c.

The author states that blennorrhagic ophthalmia in the dog has not, to his knowledge, been described in veterinary works, and that it is not even mentioned in the treatise on the maladies of dogs recently published by Professor Hertwig. It would thus appear that a new form of disease is to be added to the canine nosographia.

Blennorrhagic ophthalmia in the dog is in every respect analogous to that which is observed in the human subject, when there is a transference to the conjunctiva of the discharge of muco-purulent matter from the diseased urethra. This analogy is proved by the coincidence of the phlegmasia of the uretha or the vagina, which is called gonorrhœa, in the animal thus affected, and also by direct experiments made by M. Guilmot producing identical results. "In following with attention," says M. Guilmot, "the progress of this form of ophthalmia, we find that after a short space of time, the vessels which ramify over the conjunctiva converge towards one or several points of the cornea, where they terminate in a small vesicle which soon opens on its summit, constituting a small sore (leucoma), which sometimes becomes ulcerous." The convergence of the vessels has, in all the cases that have come under the notice of the author, constantly assumed the same form, namely, the pyramidal, the base of which occupies the lateral inferior part of the sclerotica, and the summit terminates towards the circumference of the cornea, or its central point. This description belongs, there is no doubt, to pterygium, which becomes thus one of the phenomena pathognomonic of blennorrhœa in the dog, just as it seems to be one of the consequences of catarrhal ophthalmia in the human subject. It must, however, be observed that the appearance of pterygium in the dog is nothing to be surprised at, when the development of the semi-lunar fold of the conjunctiva towards the inner angle is taken into consideration, or, as it has been asserted with some reason, that this pathological product has its origin

in the caruncula lachrymalis and the tissue which covers it, one must see that in the dog there are all the elements to cause the development of pterygium when provoked by fluxion.

After describing the phenomena which constitute the acute and the chronic states of the malady, the author enters upon the etiology and a research of the principal cause of the evil. It is useless to state that he finds this in the products of the pre-existing phlegmasia of the genito-urinary organs. From information obtained, he says, from the keepers who had the care of the dogs, there exists a redness of the meatus with itching, and an irresistible desire to coition in males; in the females a tumefaction of the vulva, from which there is a slight discharge. Thinking that it arose from a bitch which was at heat, they contented themselves by separating the sexes, but the affection continued to run its course in spite of this and the remedies resorted to, which consisted in keeping the parts clean and the application of an emollient lotion. The keepers also informed him of an important fact, that the gonorrhœa existed before the ophthalmia, and it was only about eight days since some of them, and five since others, had shown the first symptoms of ophthalmia. It was then that M. Guilmot was requested to attend them. There were thirteen in all affected; they were setters and pointers. The phenomena observed in the genito-urinary organs of these animals must evidently lead to its being considered as urethro-balanite in the male, and urethro-vaginite in the females. In the latter it was less acute than in the former, but the ophthalmia was of the same intensity in both sexes. In all of them there was secretion of pus mixed with mucus of a yellowish-white colour.

The author now tried to discover whether the ophthalmia was the result of a direct transference of the muco-pus to the oculo-palpebral membrane, or the consequence of contagion through miasmatic influence. To solve this question, M. Guilmot resorted to direct experiments. This was done by depositing the blennorrhagic pus on the oculo-palpebral membrane of two setters, three years' old, which had had the distemper, and might therefore be considered fit subjects. The application was kept on by means of a bandage for nine hours. On the third day phlogosis, pruritus, and occlusion of the eyelids were present; on the fifth day, heat, weeping of the eyes, and complete occlusion with photophobia; on the seventh day, secretion from the conjunctiva, agglutination of the eyelids, vascular injection, and pterygium; on the eighth, the vascular pterygium was more clearly defined, converging to one or several points in the cornea, so as to

form slight pustules or ulcers; on the tenth day ulcers showed themselves on the cornea.

From this experiment results the sequence that ophthalmia produced by inoculation is invested with the same character and progresses as that disease does in dogs which are affected with blennorrhœa; with this difference, that the inoculated dogs did not become affected with blennorrhœa, the affection having stopped at the organs of vision. It might have been desirable that a counter experiment should have been made, namely, that the palpebral muco-purulent matter should have been placed and kept on the mucous membrane of the urethra, or the vagina, so as to ascertain whether this would produce blennorrhœa. But little importance will be attached to these kind of experiments, when it is remembered that the results have been negative whenever made on the human subject.

These first experiments having elucidated, on the one hand, the question concerning the direct transposition of the urethral muco-pus to the conjunctiva, it remained only to inquire into the probability of contagion by miasmatic influence, or immediate contact.

Two dogs were selected for this experiment, one two, and the other four years old. Both had had the distemper, and were otherwise healthy. These animals were neither inoculated or in any other way contaminated, and were shut up for a fortnight in the kennel where the blennorrhagic dogs had sojourned; neither the litter nor anything else which had been used for the affected dogs being removed from the kennel. As in the preceding experiment, these two dogs contracted ophthalmia, but in a milder form than the two of the first experiment. There was the weeping of the eyes, with the catarrhal flux, but not the ulceration of the cornea. Does this difference belong to the breed of the dogs, they not being sporting dogs? The author does not answer this question. And then as to the question of miasmatic communication of the malady, he says that in this last experiment the contamination has been produced by the direct transposition of the blennophthalmic muco-pus from the litter to the conjunctiva, which might have taken place by the animals rubbing their eyes with their paws, or by the immediate contact of the impregnated straw. Twice M. Guilmot has had an opportunity of observing blennorrhagic ophthalmia in the dog, and that on a somewhat large scale, viz., in 1853 and 1856, and in both instances the animals belonged to sporting breeds—pointers, setters, retrievers, &c. They were usually kept confined in kennels, which were overcrowded, and wanting in everything

to be desired in a hygienic point of view: the diet bad in quality and insufficient in quantity; absence of exercise; bad ventilation; mixture of the sexes, &c. This was the state of confusion when the malady made its appearance, which necessarily must have given to it a special malignity, and contributed at the same time to its diffusion.

At the second appearance of the malady, M. Guilmot tried first to ascertain the fact whether the blennorrhagia urethralis was transmissible by direct contact. To this end be put a male pointer with a blennorrhagic bitch, and five days after he was convinced that the male dog was affected with the same malady.

In the treatment of this double affection, the author recommends two methods. The first is hygienic, the second is the employment of medicaments which have those particular properties that would be recommended in similar affections which he has described. The hygienic consists in the separation of the sexes, good ventilation, moderate temperature, cleanliness, and a moderate diet, consisting of milk and water, veal broth, &c.

The medical consists in the use of purgatives, the balsam of copaiba; and pomade of red precipitate.

Of 24 dogs treated thus, all were cured of the blennorrhagia in fifteen days; 15 were cured of the ophthalmia in twenty-two days, 4 remained affected with albuginea on both eyes; 2 were blind, and 3 lost one eye each.

Clinique Vétérinaire, June, 1862.

CATARRH OF THE GUTTURAL POUCHES.—OPERATION OF HYOVERTEBROTOMIA.

By M. Boisnard, Vétérinaire à Angoulême.

In the month of April, 1861, the author was sent for to attend a mare, seven years old, which had been purchased about three months previous, at which time she had a cough, and there was also a discharge from the nose. This was supposed to be chronic strangles. The mare was not attended by a veterinary surgeon, but by a blacksmith, who had inserted a seton under the chest, which was in at the time of the author's first visit. The proprietor, seeing that the cough continued, decided on submitting the animal to the care of a veterinary surgeon.

Symptoms. The mare was in good condition; she had a long and rough coat, as compared with the other horses in

the same stable; there was an abundant discharge from both nostrils, but most from the right; it consisted of mucus, was of a greenish colour, and adhering to the sides of the nose; the lining mucous membrane was somewhat discoloured, but no trace of ulceration existed; the submaxillary ganglions were the size of a nut, but neither adherent nor painful; the surface of the body, inspected with care, presented neither buds nor farcy cords.

The Diagnosis was catarrh of the respiratory passages, with suspicion of glanders.

Treatment.—Tartar emetic was given in increasing doses with aromatic fumigations; a light diet was ordered in which carrots were substituted for the dry fodder, and sequestration of the patient.

Ten days after the discharge was not so copious, and was confined to the right nostril; its nature was also changed, consisting still principally of mucus, but of a better colour and less viscid; there were, however, some globules of pus suspended in it. The submaxillary glands were in the same state as before. The cough was sonorous, and accompanied by a sort of snorting (*ébrouement*). The frontal sinus was percussed, and the parotidial region examined with care, but nothing abnormal was discovered. The treatment was changed to the use of kermes and tartar emetic, with camphor fumigation, and frictions were made on the nasal region with the ointment of tartar emetic. Six days after the discharge was about the same, but the cough was less. A seton was now inserted on each side of the neck, the submaxillary glands were stimulated with the ointment of Lebas, and the fumigations and medicines as before ordered were continued. Eight days after the enlargement of the glands had disappeared, the discharge from the nose was intermittent, that is to say, it only occurred when the mare held her head low, which she was easily induced to do by putting some food on the ground. But on these occasions the nature of the discharge was entirely purulent, with its characteristic odour. The mucous membrane had reassumed its normal colour, and its surface only secreted a colourless liquid, and that in small quantities, which, mixing with the pus, rendered that more fluid. The sinuses were again explored, but no dulness of sound could be detected; the parotid gland, however, on the right side seemed now a little more prominent than the left.

The nature of the discharge and the manner of its manifestation, led the author to suppose the existence of a purulent collection either in the sinuses of the head or the guttural

pouches, but having detected nothing abnormal in the percussion of the frontal region, and attributing to the distention of the guttural pouch the prominence of the right parotid gland, it was rational to think that the purulent secretion had its seat in the mucous membrane of that organ, and that all treatment short of the operation of hyovertebrotomia would be of no avail. The proprietor, being then in Paris, was informed of this by letter, and requested at the same time to consult M. Bouley, professor of the clinic at Alfort, on the symptoms presented and the nature of the operation contemplated. Professor Bouley advised the operation, and assured the owner that it was simple and without danger. It was consequently performed on the 5th of June, with the assistance of a colleague, M. Fargeas. The patient being properly secured, the *modus operandi* was that taught at the school, that is, by cutting down on the pouch. On making the canular opening some fluid escaped from the right nostril, which plainly confirmed the diagnosis as to the nature and seat of the affection. After having passed a seton, the patient was released. Restricted diet was recommended.

About an hour after the operation, strong reaction set in, the head was extended, the mouth open, the respiration accompanied by a sort of roaring noise, and the mucous membranes were injected. The abstraction of blood was ordered, with gargles, &c.; and fancying that the seton might have contributed to this state of things, it was removed, and the openings left, to prevent their too speedy closing, were cauterised. Three days after, the breathing was less impeded, the discharge from the nostril had almost ceased, the purulent discharge from the intermaxillary opening was much less, but the pulse was still hard. The bleeding was repeated, and the former treatment continued, with a repetition of the cauterisation of the openings. At the end of a week all the unfavourable symptoms had disappeared; the discharge was very little and intermittent, and the openings progressed to a speedy cicatrisation.

This case, the author says, is important inasmuch as it necessitates an operation which, like trephining the sinus, may bring about the cure of catarrhal affections, against which, in the majority of cases, internal treatment and topical applications have no effect; and it is also often confounded with glanders.

Journal des Vétérinaires du Midi, February, 1862.

CURE OF A CASE OF GLANDERS.

By M. Guyon, M.V.

In a letter to the director of the Veterinary School of Toulouse, M. Guyon relates a case of glanders cured by the complex administration of arsenic and nux vomica.

In the month of May, 1861, he says, a horse was brought to him from the neighbourhood of Charente, said to be affected with chronic strangles. The animal was five years old, and of the anglo-French breed. On examining the patient, it was not difficult to come to the conclusion that it was a case of chronic glanders. The discharge from the nostrils was of a greenish colour, thick, and adhering to the sides of the nose, the mucous membrane was ulcerated, and of a pale colour, the lymphatic glands under the jaw were enlarged, painful, and adhering to the bones. All these symptoms M. Guyon avers are undoubtedly those of glanders. The patient was subjected to the treatment of nux vomica, according to the formula of M. Martin, and in forty-five days, after an intermittent administration of it, with the addition of some fumigations and a well regulated diet, the cure was pronounced to be complete.

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF THE COUNCIL, held June 3, 1862.

Present:—Professors Spooner, Simonds, and Varnell; Messrs. Braby, Burley, Cartledge, Dickens, Ellis, Ernes, Field, Hunt, Kerr, Lawson, Legrew, Moon, Robinson, Wilkinson, Withers, and the Secretary.

F. R. Silvester, Esq., in the Chair.

The minutes of the preceding meeting were read and signed. Two letters were also read from Dr. Struthers relative to the resolutions adopted by the Council, which were evidently satisfactory to the Scotch Board of Examiners.

The election of a president for the ensuing year was then proceeded with.

It was moved by *Mr. Field* and seconded by *Mr. Wilkinson*, "That Professor Simonds be elected president for the ensuing year," and on the ballot being taken, that gentleman was declared unanimously elected.

Professor Simonds having taken the chair, returned thanks for the honour of his election.

The election of six vice-presidents followed when the following nominations were made:

Mr. W. J. Goodwin, of Hampton Court, by *Professor Spooner*.
— J. Gardner, of Dumbarton, by *Mr. Lawson*.
— J. S. Gamgee, of Birmingham, by *Mr. Cartledge*.
— T. W. Gowing, of London, by *Professor Varnell*.
— E. Harrison, of the Royal Artillery, by *Mr. Wilkinson*.
— R. Skelton, jun., of Leyton, Essex, by *Mr. Cartledge*.
— M. J. Harpley, of the Royal Horse Guards, by *Mr. Field*.
Professor Dick, of Edinburgh, by *Mr. Robinson*.
Mr. W. Aitkin, of Kilmarnock, by *Mr. Ellis*.
Professor Gamgee, of Edinburgh, by *Mr. Hunt*.
Mr. F. Bland, of Boston, by *Mr. Dickens*.

The result of the ballot was—for M. J. Harpley, 14; W. J. Goodwin, 12; Professor Dick, 12; Professor Gamgee, 12; J. S. Gamgee, 10; T. W. Gowing, 8; E. Harrison, 7; W. Aitkin, 5; R. Skelton, 5; F. Bland, 4; J. Gardiner, 4; whereupon Messrs. Harpley, Goodwin, Dick, Gamgee, J. S. Gamgee, and T. W. Gowing, were declared duly elected.

It was moved by *Mr. Silvester*, "that Mr. Coates be elected Secretary for the ensuing year." On the ballot being taken, Mr. Coates was declared unanimously elected.

A copy of a work, "the Rot in Sheep," by Professor Simonds, was presented to the library by the author, when,

It was moved by *Mr. Silvester* and seconded by *Mr. Braby*, "That the thanks of the Council be given for the same." Carried.

It was moved by *Mr. Ernes* and seconded by *Mr. Wilkinson*, "That the thanks of the Council be given to the retiring President, F. R. Silvester, Esq., for his courteous and efficient services during the last year."

The resolution was carried by acclamation.

Veterinary Jurisprudence.

COURT OF COMMON PLEAS, Guildhall, May 17.

(Sittings at Nisi Prius, before Lord Chief Justice Erle *and Common Juries.)*

BRYANT *v.* Tummons.

This was an action to recover the value of a dog alleged to have been killed by the defendant, and also damages for injury to another dog.

Mr. Joyce and Mr. Talfourd Salter appeared for the plaintiff, and Mr. H. Chambers, Q C., for the defendant.

It appeared that on the 14th of November last the plaintiff was out with his dogs, one a greyhound, called "Old Joe," and the other a brindled lurcher bitch, in Hedon fields, in the neighbourhood of Croydon, of which the defendant is farm tenant. The defendant, believing the dog to be after his rabbits, fired at the greyhound and shot it in the side, and it rolled over, but got up again bleeding. He afterwards followed the dogs into an adjacent wood, and, after some words with the plaintiff, fired again, wounding the lurcher bitch. The defendant was summoned before the magistrates for cruelty to these animals in firing at them, and the plaintiff subsequently brought the present action against him for the value of the greyhound, which, it was alleged, died a few days afterwards of the wounds it had received in the side, and also for damages to the brindled lurcher bitch. The greyhound was said to be very fast and well bred, and was estimated by the plaintiff at £20 value. The case for the defendant was that he never shot the dog; and that, if he had injured it when he fired, the dog had not died of the wound it received, as it was seen running about and leaping over a wall nine feet high, apparently having nothing the matter with it, on the morning of the day on which it died; and it was suggested that the plaintiff had himself shot the dog for the purpose of this action. Evidence was also called to prove that the plaintiff had offered to settle the matter for £1 or £2; and also that he had been bidden 5*s.* for the dog, but wanted 10*s.* some time before it was announced that "poor old Joe" was dead; and it was contended that the dog was worthless, and the action a trumped up one, which ought not to have been brought in a superior court.

His Lordship having summed up the evidence,

The jury found a verdict for the plaintiff—Damages one farthing.

LAMBETH.—June 11th.

Edward Smeed, a member of a gang of notorious horse copers, was placed at the bar before Mr. Elliott for final examination, on a charge of obtaining £15 by false pretences from Mr. Thomas Holden, coal merchant, of No. 7, Trafalgar Street, Walworth.

Mr. Fletcher appeared for the prosecution, and Mr. Beard for the defence.

Mr. Holden deposed that on Tuesday, the 27th of last month, he was at the Horse Repository in Barbican, when he saw the prisoner and heard him tell another man that he had got two horses that he had brought from his father's farm at Dagenham, in Essex, for sale. They were, he said, at the shop of a farrier in the neighbourhood. One, he said, was a van and the other a cart horse, and both were sound and useful animals. The witness asked him if he could see the horses, and the prisoner replied he could, and took him for that purpose to the shop of a farrier, in Aldersgate Street. There he found two horses. He said that his father had bought both when they were four years old, that they were then seven, and perfectly sound, and that his father's only reason for parting with them was that he had no more work on the farm for them. The witness examined one of them, a fine-looking bay horse, and, the prisoner having warranted it perfectly sound and useful, he agreed to give £15 for it, and handed the prisoner a sovereign deposit, and told him to come to his house in the course of the afternoon, when he would pay him the remainder of the money. The prisoner did call at his house, and said his man was on the way with the horse. He paid the £14, requesting the prisoner at the same time to write down his name and address in a book he handed to him for the purpose. The prisoner accordingly wrote his name, "Edward Smeed," and his address, 56, Green Street, Stepney. The witness told him that this was not the address he gave him before. He admitted that, but said 56, Green Street, was the address of his aunt, and, as he was often in town, he would be always heard of there. He received his money, and soon after the horse was brought to his place, followed by three or four men, who kept whipping and knocking it about, saying it was a "rank roarer," and that he had been grossly taken in by his purchase. The horse, owing to the way in which they knocked him about, certainly bled freely. One of the men offered him different small sums for the animal, saying that if he kept it he would be prosecuted by the "Society for Cruelty to Animals." It was with some difficulty he could get the horse out of their hands. On the following morning a person named Wilson came to his house, and, without requiring to see the horse, gave him six sovereigns for it, saying he had frequently bought it before. From what he, Mr. Holden, had heard, it was his belief that he had been grossly imposed on. He had, therefore, placed the case in the hands of Sergeant Hull, a detective officer.

Sergeant Hull, 32 P, was next examined at considerable length. From his statement it appeared that the prisoner was a member of a gang of horse copers who had for some time past been making large sums by the horse in question. The poor animal, though extremely handsome and apparently valuable, was in such a state that if driven quickly 300 or 400 yards it would drop down as if shot, and before doing so would give such indications of his disease as to leave no doubt of his being a "rank roarer." When advertised for sale, or when a customer was found for him, the sellers were in the habit of giving the animal a pint of linseed oil, which had the effect of easing the lungs for eight or ten hours, and of making it exhibit all the appearance of splendid action. By this means they had been enabled to sell the horse as often as forty times, and by the same means as that adopted in Mr. Holden's case they succeeded in getting it back again, sometimes for £1 or 30*s.*, so that it became their stock-in-trade. In conclusion, Hull said that after the former examination of the prisoners he went to the

Wellington public-house in North Street, Bethnal Green, when Mr. Handley, the landlord, told him where the stable was and where the prisoner kept his horses. He there found the horse in question in the care of a lad then present. Mr. Holden at once identified the animal as the horse he purchased, and they sent for a veterinary surgeon, who attended, but who was unable to examine the horse at that time, owing to the violence of some of the persons who came up. He, Hull, however took possession of the horse on the following day, and the veterinary surgeon then examined it, and was present to speak to its state.

Mr. James Howard, veterinary surgeon, of Stepney Green, said he examined the bay gelding in question, and found it labouring under a chronic disease of the lungs. It was totally incapable of doing any work whatever, and not worth 50*s.*; in fact, only what it would fetch at the knackers, and it would be a charity to destroy it. On examining its nostrils he found too small cuts with some sharp instrument, and these he had no doubt had been inflicted by some of the party to cause a bleeding, and thereby give Mr. Holden a greater disgust for his bargain.

The prisoner reserved his defence.

A man named *Charles Gaydon* here came forward, and in a bullying tone said the horse was his, and that he paid £8 10*s.* to Mr. Wilson for it.

Mr. Holden, the prosecutor, here identified him as the person who most ill-used the horse on the evening it was brought to his premises. He also offered sums from £1 to £5 for the purchase of the horse, and the following morning as early as 7 o'clock, to try and get the horse back, but at this time he had sold it.

Other evidence was given connecting this man with the prisoner Smeed, and both were committed for trial, Gaydon on the charge of conspiracy.

The prisoners were admitted to bail, and were bailed by the father of Smeed, who is not a farmer, but a warehouseman, and Mr. Hanley, the landlord of the Wellington public-house.—*Times.*

MISCELLANEA.

SALE OF MR. JONAS WEBB'S CELEBRATED SOUTHDOWN SHEEP.

On Wednesday June 11th, the remainder of the Babraham flock of pure-bred Southdown sheep, which has invested the name of Mr. Jonas Webb with such deserved celebrity, was exposed to public competition under the joint direction of Mr. Strafford and Mr. J. Carter Jones. There was a very large attendance of breeders from almost all parts of England —Sussex, which may be regarded as the original home of the Southdown, being powerfully represented; while buyers were also present from France, Germany, Spain, Sweden, and

America. The lots disposed of comprised 148 rams and 289 ewes, and the former realised altogether £2711 2*s.*, and the latter £2209 6*s.*, making the total proceeds of the day £5270 8*s.* Last year, when the first portion of the flock was disposed of, 967 animals realised £10,926 6*s.* 6*d.*, so that this great flock, which is now scattered throughout England, Europe, and, indeed, it may be said the world, has altogether produced to Mr. Webb the satisfactory sum of £16,646 14*s.* 6*d.* The highest priced ram yesterday was taken by Sir T. B. Lennard, but most of the ewes which provoked any competition were purchased for exportation to Spain and Germany, while a few lots were taken for America. At the close of the sale, which may be regarded as an important event in the agricultural world, hearty cheers were given for Mr. Webb and his family, and general regret was expressed that a period has been put to the genial hospitalities of Babraham which have extended over no less than 36 consecutive years.

OBITUARY.

Died lately at Croydon, Surrey, of phthisis, William Dyer, M.R.C.V.S., aged thirty-five. His diploma bears date June 11th, 1845.

Also on the 30th May last, aged fifty-four, Peter Oswald Polding, M.R.C.V.S., of Bury, Lancashire. His diploma bears date Dec. 10th, 1833.

Likewise on May 26th, William Cox, M.R.C.V.S., of Ashbourne, Derby, aged fifty-four. His diploma bears date May 15th, 1845. Although comparatively speaking a young man, we are informed that Mr. Cox was completely worn out with the anxieties and duties of his profession.

Thus one after another those we have known as students fall in the battle of life before us. Being younger than ourselves, we—and perhaps they—might have thought that the warfare was not ended with them, nor even the time come for them to unloose their armour. It has, however, proved otherwise, and it is not for us to question the decrees of Providence, which, though sometimes dark and mysterious, must be founded in wisdom and mercy, the attributes of the Deity.

> "In spite of all, in erring reason's spite,
> One thing is clear—whatever is, is right."

THE

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Communications and Cases.

CASE OF EXTENSIVE DISEASE OF THE HEART OF A FILLY.

By Andrew Fuller, M.R.C.V.S., Ramsey.

July 16, 1862.

My dear Sir,—I was yesterday requested to make a *post-mortem* of a filly which had suddenly died. The investigation brought to light the existence of pericarditis associated with hydrops pericardii. A favorable opportunity occurring, I have forwarded the heart, pericardium, and part of the lungs, to you, never having met with any case in which the heart was so extensively diseased.

The subject was a two-year-old half-bred filly, which has never thrived so well as those kept with her. About a month since, a slight cough, with the ordinary symptoms of simple catarrh, were observed. Since that time, however, no difference in her condition was to be detected until a few hours previous to her death, when the respiration became very difficult.

Post-mortem examination.—The abdomen was filled with a fluid resembling serum, and the intestines were much contracted and empty, still not unhealthy in appearance. The liver was very much enlarged, being very firm in substance, and gorged with black blood. The kidneys and spleen were in a similar condition.

The thorax contained a very large quantity of dark-coloured fluid, unmixed with lymph. The pleura was healthy, excepting where the pericardium was attached to the sternum and ribs, about six to eight inches square.

It is unnecessary for me to make any remarks relative to the condition of the heart, excepting to say that the pericardial

sac contained about two gallons of a light, straw-coloured fluid, commingled with lymph. Can any cause be assigned for such a disease as this? Is it of a dropsical diathesis, or is it inflammatory in its nature? This is the second case of heart disease which I have met with during the last fortnight,

To Assistant-Professor VARNELL.

OBSERVATIONS ON THE ABOVE CASE BY ASSISTANT-PROFESSOR VARNELL.

On the receipt of the above letter, I wrote Mr. Fuller a brief reply, the substance of which will be embodied in the remarks which I am induced to make on the case.

The paucity of recorded cases of pericarditis in veterinary literature would lead to the inference that they were of rare occurrence in domesticated animals. I am, however, inclined to think—nay, I feel almost confident—that those practitioners who have made it their especial object to examine, *post-mortem*, the animals which have died in their practice, will agree with me that diseases of the heart and its membranes are not so rare as might be supposed. Their not being more frequently noticed, I think may be satisfactorily accounted for. In the first place, the symptoms are often so very ambiguous that an incorrect diagnosis is likely to be formed, by which, should the animal die, an imperfect examination is almost certain to be made, so that the true nature of the disease is not disclosed. It may also arise from the following circumstances. On opening the cavity of the chest, should the pleura and lungs show no particular lesions, the heart and its membranes are perhaps not suspected to be diseased; or if a variable amount of fluid be found in the pleural cavities of the thorax, or in the peritoneal sac of the abdomen; or if any of the abdominal viscera are engorged with blood—which is very likely to be the case, from imperfect functions of the heart—then the death of the animal is thought to be satisfactorily accounted for, when, in reality, the appearances are simply the effects of heart disease.

Mr. Fuller remarks, in his communication, that he has never seen a case in which the pericardium was so extensively diseased as in the one in question. Now, if he carries his thoughts back to the period of his pupilage at the Royal Veterinary College, he will remember to have seen several splendid specimens, showing the effects of pericarditis, both in the horse and ox, some of which were identical in their character with the one recorded by him, and in which the

deposit of lymph on the surfaces of the pericardium was quite as extensive.

It is stated in the above letter that the filly from which the morbid specimen was taken had never thriven so well as the other animals which were with her. This may have been the case, but I have not been able to detect anything in the parts sent me which would account for such a phenomenon. The walls of the heart were naturally developed; its valves perfect, and free from any accretion on their surfaces; disease, however, may have existed in some other organs, which, although not detected, might not only interfere with the health of the filly, but would also predispose her to inflammation of the pericardium. A tendency to rheumatism, which could not, of course, have been detected by a *post-mortem* examination, is said to be a most fruitful cause of inflammation of the pericardium in the human subject, and also of the endocardium and tendinous rings of the auriculo-ventricular openings, and I see no reason why it should not also be a predisposing cause in the lower animals.

The brief history Mr. Fuller gives of the case leads to the conclusion that the cold the filly was labouring under about a month before her death was the exciting cause of this attack. This view seems to be confirmed by the *post-mortem* appearances; as the character of the deposition, both on the surface of the serous membrane and also beneath it, would fairly correspond with the length of time the filly lived after having contracted this cold.

The symptoms of pericarditis, as I have before stated, are often so very ambiguous, and so insiduous in their progress, that they are likely to be mistaken for *pleurisy or endocarditis*. Although there are indications of pain, expressed by an anxious countenance in particular, still, as the poor animal cannot direct our attention to the especial seat of suffering by words, we have not the same opportunity of making a correct diagnosis of such cases as the human practitioner has.

It appears that Mr. Fuller was not called in to attend the case, but only to make a *post-mortem* examination. If the filly had been under his care from the period of her original attack of illness, he would, without doubt, have been able to have given a description of the symptoms in each stage of the disease. This would have been very valuable, even in a statistical point of view, for in diseases that are difficult to diagnose, an account of the symptoms, honestly and accurately described, cannot fail to be of the greatest value, especially to the junior practitioner, in determining the nature of a disease. In veterinary practice there are great difficulties

in the way of a correct diagnosis being formed, especially in affections either of the heart or its membranes, when compared with those of human medicine. The absence of speech, and the comparative difficulty in auscultating the region of the heart in the horse and similar formed animals, are, perhaps, the principal causes of this difficulty. I have met with practitioners who have thought themselves very clever in diagnosing such cases, and, indeed, all others; but I have, nevertheless, often known them to make great mistakes; and I feel confident that errors will continue to be made, particularly in heart diseases, by the best informed of our profession. If we are fortunate in forming a correct diagnosis in these cases, a prognosis is easily determined; for, in my opinion, very few cases, even of simple pericarditis, ever survive, and if complicated with other diseases of the heart, the prospect of a cure is even still more remote.

If we investigate the pathological changes which take place in these affections, we can easily understand how the symptoms will not only vary in degree, but how additional ones will of necessity be developed in the progress of the disease. To illustrate this assertion, let me briefly allude to the morbid specimen in question. The parts consisted of a small portion of the lungs, the serous and fibrous pericardial sac, and the heart.

The lung gave evidence of the vessels having been congested with blood. The outer pleural covering of the fibrous sac, with the exception of a slight portion of it, was unaffected by disease. The fibrous sac was thickened and very much enlarged, which would be inferred from the large quantity of fluid it was said to contain. The serous covering of the heart was thickly covered with lymph, as was also that portion which covers the inner surface of the fibrous sac, but to a less extent. The subserous tissue was thickened by a deposition of lymph in its structure, and the muscular walls of the heart were of a palish, dirty-brown colour, and much softer than natural. The lining membrane of the auricles and ventricles, the bicuspid and tricuspid, and also the semilunar arterial valves, were free from disease. Such are the pathological changes produced in the parts sent to me. Mr. Fuller states that the liver, spleen, and kidneys were very much engorged with black blood, and that the abdomen contained a large quantity of serous fluid. He also states that the thorax contained a considerable quantity of dark-coloured fluid. Such a condition of the abdominal viscera and character of the effused fluid, we should, *à priori*, expect. They are to be viewed as the effects of impeded circulation, and may be

explained by the heart's action being interfered with by the combined pressure imparted to its walls by the effused material, the fluid, and the adhesion of its outer serous membrane with that of the fibrous sac.

I might go on to explain in detail several of the phenomena thus briefly alluded to, and which I feel tempted to do, so full of interest is the subject, but I find that I must desist, as I have already extended my remarks further than I had originally intended.

In conclusion, I would earnestly recommend, for the benefit of the profession, that its members pay more attention to their *post-mortem* examinations, with a view to publish such cases as appear to them to possess interest. The Editors of the *Veterinarian*, I have no doubt, will give every attention to all the communications which they may from time to time receive. I offer myself as a volunteer, and, if permitted, I shall be glad to give my feeble assistance in elucidating, as far as I am able, all cases that are placed in my hands, according to the time I have at my disposal.

THE LIABILITIES OF VETERINARY SURGEONS.

By G. T. Brown, Professor of Veterinary Surgery,
Royal Agricultural College, Cirencester.

While we are justly seeking new privileges and immunities on the basis of our charter, we are forgetting one very important defect in our constitution, which we may easily rectify ourselves.

It is scarcely necessary to remind the profession that "accidents will happen," or, at least, constantly do happen, and that in spite of skill and foresight. No one will deny that a fractured spine may occur, even with patent hobbles and the most practised assistants. The accident, happily, is rare, and doubtless unpleasant in the extreme. We can imagine the black look of the owner of a valuable horse, on whom a simple operation has entailed so unfortunate a result, nor should we fail to expect an uncompromising demand for compensation.

How often, again, do we observe an animal nearly suffocated from an involuntary fit of coughing during the exhibition of a draught; the most careful attendant can but release the patient's head under such circumstances. No precaution can prevent the passage of a little of the fluid into the larynx,

nor determine the amount or consequences of the spasm that must follow.

In many instances a fatal result exposes the practitioner to a considerable pecuniary loss, or subjects him to the annoyance of legal proceedings, which, if they terminate in his favour, are not unattended with expense.

We are led to these remarks in consequence of some cases lately brought under our notice; one instance we quote, from its extreme absurdity, the other as illustrating the point we intend to insist upon, viz., that in the present state of affairs it may be more convenient to submit to a manifest injustice than to assert a right at the expense of time and money.

In the first case, a certain horse was brought to us for examination by a purchaser; the opinion given was to the effect that the animal was sound, save a trifling and temporary defect, that was removed in a week or two. About six weeks subsequent to the examination we understand some disease appeared in the eyes. The convenient phrase, "of long standing," it seems, was applied by a looker-on, and upon this the owner kindly proposed that the opinion should be tested by competent authority, and if corroborated, that we should take a share of the loss which would be incurred by the sale of the animal in an unsound condition.

The proposition was, as editors say, "declined with thanks;" the request, nevertheless, stands as an amusing instance of what a professional man may expect to meet with occasionally. A threat of legal proceedings, of course, followed, but the matter dropped. What might be the nature of the disease attacking the horse, six weeks after the opinion was given; in short, whether he had any eyes at all left at that time, are questions which we profess to be entirely unable to answer; but that a veterinary surgeon should be held for a moment responsible under these circumstances is surely a proof that the ridiculous has no limit.

An old and well-known member of the profession recently related to us the next instance.

In the course of his practice he happened to have a case of pleuro-pneumonia in a somewhat refractory subject. The attendant sent to administer medicine was instructed to obtain the assistance of the coachman, and to use every caution. It happened, however, that after a certain draught the patient fell, struggled, and died, may be from the excitement of the respiration leading to asphyxia, may be from exhaustion, or possibly from contact of some of the draught with the sensitive membrane of the larynx, leading to spasmodic closure of the opening. Another veterinary surgeon

decided that the horse died from suffocation. The practitioner did not take refuge behind any plea, did not even seek for absolute proof, but admitted that the draught was the probable cause of death. The owner demanded the full value of the animal, and, in spite of all representations, decided to seek compensation in the court. The veterinary surgeon, in the full belief that he was not liable, nevertheless to avoid incurring expense and loss of time, not to speak of the annoyance, compromised the matter for a considerable sum.

Our object is not to discuss the law relating to either of these or to similar cases. What we desire to insist upon is the fact, that a man, smarting under an unanticipated loss, arising from no act on his own part, is commonly excessively anxious to attach blame to the man by whose act he has suffered, and this totally irrespective of the simple justice of the case, as our quoted instances may serve to show. The law distinctly exonerates us, unless we have been guilty of "culpable negligence," by our own act or the act of our agent who represents us, and for whose proceedings we are, of course, responsible. This clause is well known, but the difficulty is that the man who has lost his horse, apparently in consequence of any act of his veterinary surgeon, is inclined to a much more extended interpretation of the clause than the said attendant will allow, and hence an appeal to the law courts is the only method of deciding whose view is correct. Precisely at this point occurs the defect in our constitution of which we complain—the absence of any properly arranged association before whom a disputed point might be placed, and who, in the event of a decision in favour of the veterinary surgeon, should be in possession of funds to defray all legal expenses. This association we appeal to the profession to establish at once; a small subscription from the members would suffice. The election of proper officers from the most influential members would be easy enough, and the whole affair is settled. In the future, any member threatened with legal proceedings would at once, as a matter of duty, submit his case to the committee, who, deciding in his favour or otherwise, would determine his course. If it were apparent that the mischief had resulted from his negligence, he would be advised to compromise; if not, he would be instructed to defend any action that might be brought against him, the association defraying all expenses.

With such protection, the number of actions would, we feel convinced, be materially lessened, and many commencing practitioners, and even established ones also, be prevented from sacrificing a principle to their own convenience or to

a fear of consequences, while in every case the matter would assume the shape of a public and professional question, instead of being, what it commonly is now, a private quarrel, in which position and capital have the advantage over justice and common sense.

CASE OF TETANUS IN A MARE.—RECOVERY.

By Charles Dickens, M.R.C.V.S., Kimbolton.

June 14th, 1862, at 7 a.m., John Bolton Hall, Esq., of this place—father of my late pupil, J. Hall, now V.S. to the Royal Artillery—requested my immediate attendance on a four-year-old thorough-bred mare ("Vortex"), with a foal by her side, and supposed to be about five months advanced in pregnancy.

Symptoms.—I found her standing in the paddock, with the hind legs wide apart; or rather reeling, for she had a great difficulty in keeping her equilibrium. The surface of the body was very cold, tail erect, and the muscles of the head and neck rigid. Great tenderness was evinced on passing the hand over the loins, but more especially so about the head of each femur. The pupils were much dilated; respiration hurried; pulse 80, strong, and possessing such a character as, under some circumstances, would have indicated the propriety of immediate venesection. The rectum was impacted with fæces, and the jaws so fixed that the incisors could not be separated. The pupils were dilated; there was, however, no protrusion of the *membrana nictitans,* nor did such subsequently come on. The mammary gland had a peculiar shrunken appearance, and the lacteal secretion was very scanty.

It was with much difficulty we removed the patient a few hundred yards into a roomy box.

After removing a portion of the fæcal matter from the rectum, and seeing her comforts attended to, I left her under lock and key, that she might not be disturbed, promising to return at 9 a.m. An urgent professional call, however, delayed my visit, so that I did not see her again until 11 a.m.

I found her more tranquil; the surface of the body warmer; pulse 75, but improved in character. She still staggered a great deal. As she seemed anxious to take some nutriment,

I had a small portion of very thin mash placed before her, with which was mixed—

Nit. Potass., ℥j ;
Pot. Ant. Tart., ʒj ;
Hyd. Chlorid., ℈ij.

4 p.m.—She stands with her legs closer together, is quiet, and I fancy has less rigidity of the jaws. She has sucked up a small portion of the sloppy mash, and also some water. The rectum was again emptied, and some young clover placed before her, which she tries hard to get into the corner of her mouth.

15th.—Going on favorably; pulse 60: she moves much better. The pupils are less dilated, and I can place the little finger between the incisor teeth. The bowels are also acting.

Continue mashes, mixed with a few scalded oats, and give the medicine night and morning, omitting the calomel.

16th.—Symptoms more favorable. Jaws still more relaxed; lacteal secretion increasing.

17th.—Convalescent.

Was this tetanic affection brought on by the animal being exposed for a few days previously to frequent showers of rain and cold winds?—or was it produced by the foal—a strong one—requiring more milk than was secreted, thus causing it to be constantly worrying the mare by tugging at her mammæ? As I inclined to the latter opinion, I suggested the propriety of taking the foal off, but I was fearful, nevertheless, that, by so doing, the mare's agitation and fretfulness might prove even more injurious than allowing it to remain with her. We therefore decided, and perhaps wisely, upon its remaining. Its appetite was tempted with crushed oats and young clover, both of which it soon ate with avidity.

My opinion of the cause in this instance was influenced by my experience of similar cases in other animals, as I have often seen the sow and also the bitch with symptoms somewhat analogous, from their being what is called "over-tugged at" by their youngsters.

I attribute the recovery of the patient, in a great measure, to the particular care which was taken in keeping her perfectly quiet; for without wishing to at all undervalue the benefit derived from medicinal agents, having often witnessed great good from the use of both purgatives and sedatives, I am convinced that our great dependence must be based on the soothing system. To borrow the language of that distinguished professor of veterinary science, the late Mr.

Sewell, keep the key in the pocket, and see that "no one is admitted except on business."

In some places a horse with lock-jaw causes quite a consternation, and many persons are anxious to see the patient, and thus are constantly disturbing him. I recollect, some ten years since, being summoned late one winter's night to go a journey of twelve miles to see a valuable hunter which was very ill. His owner, it appeared, had about a week previously got upon him at the covert side, intending to ride him in the hunt but he stumbled and floundered about so much at every grip or ditch that he deemed it prudent to dismount and send him home. The horse was placed under the care of a person who prided himself upon having a "correct knowledge of farriery," because, when a young man, he had been groom to the "old lord."

I was informed that the patient had been twice bled, and that two quarts of castor oil had been wasted in a vain attempt to pour it down the animal's throat.

Upon entering his box the following scene presented itself. The poor tetanic creature, in the greatest state of excitement, was being fomented with very hot water about the head and neck by one assistant, while two others were engaged in performing a similar office on either side of the abdomen. Besides these, two more attendants were holding a flaring light in each hand, surrounded by several others all busy in giving occasional advice. The only recommendation I thought proper to offer was, to "put out the lights and go to bed." I need hardly add that the next morning I received a note, stating that the poor patient's light was also gone out.

FRACTURE OF THE TIBIA.—RECOVERY.

By Richard H. Dyer, M.R.C.V.S., Waterford.

On the 26th of February last a bay gelding received a kick from his stable companion, on the near hind leg, nearly midway between the hock and patella. He was brought immediately to my infirmary, and after a long and careful examination I found that the tibia was fractured, or, as I think it would be more properly designated, splintered. The diagnostic symptoms of such cases may be mentioned as, inability to move the limb, acute pain upon pressure to the part, and the capability of feeling the edge of the splintered portion of bone—an unerring guide.

I had the animal placed in a narrow stall, and properly secured to a ring in the front, to prevent any attempt to lie down. Cooling lotions were kept constantly applied to the limb, and perfect rest enjoined during two or three weeks. These means proved effectual, and the bone reunited most satisfactorily, enabling the horse to resume his ordinary work in about six weeks from the time the injury was inflicted.

I did not record this case at the time of its occurrence, as I was anxious to learn how it would progress. It may be asked by some of the junior members of the profession why this case terminated so satisfactorily, as general experience, and my own in particular, would lead to the inference that most cases of fracture in the horse terminate fatally. I have, however, as well as many other practitioners, been fortunate in the treatment of a few of such cases.

My explanation is that this animal was of a mild disposition, very docile in the stable, nothing appearing to ruffle his temper. He bore pain in a most extraordinary manner, was in excellent health at the time of the injury, and, in addition to these favorable conditions, the pieces of bone never separated from each other. Such circumstances, when present in any case, cannot fail to tend to the repair of almost any amount of damage which may be inflicted. There are patients whose irritable tempers under similar circumstances cause them—if one might so express it—to purposely undo everything which is done for their benefit. Often do we meet with such cases here, where the horses are not of the best of tempers.

The above case is not altogether without interest, inasmuch as it shows that we need not take an unfavorable view of every case of fracture. It will help also to explain to the general public that they need not give so much heed to those wonderful cures which they sometimes read of in the newspapers. A practitioner of veterinary medicine not long since published a case of fracture, in which he took the opportunity of stating, if my memory serves me right, that two members of the profession—I forget his precise language—had decided that the animal ought to be destroyed, but that he, without hesitation, undertook the treatment of the case, and succeeded in effecting a cure.

I know some of us are a little too precipitate in pronouncing a verdict. It has happened to myself, and I have had cause to regret it. There is an old saying, which will apply both to the medical and veterinary practitioner, that "one man must not look over the hedge, whilst another may steal a steed."

We will suppose a case, and doubtless many of your readers

have met with such a one. A veterinary surgeon is called to a case of lameness, the cause of which is occult. The animal has been under the treatment of some well-known quack, and the owner probably is a good judge of a horse, and thinks he is well versed in horse matters. Besides, he has a knowing friend or two, who have also given their opinion upon the case in question, but, strange to say, there are as many opinions as there are persons. The veterinary surgeon is therefore summoned, and is introduced to A. B. and C. I need not endeavour to decipher the knowing looks of these gentlemen as the veterinary surgeon is quietly and cautiously examining the horse in question, as every practitioner of ten years' standing must have had some experience of the kind, or if he has not he may consider himself a lucky man. At length the examination is concluded, and an opinion given, contrary, perhaps, to all those which had been so freely expressed by A. B. and C. Now, we will presume, for argument sake, that the explanation given of the case is such that all the parties are agreed with the veterinary surgeon, and we may ask what value is placed upon the opinions of those who have been called to the consultation. Simply none at all. Each says to his friend, "Ah, my dear fellow, you were mistaken! The 'vet.' is right."

Now, let us take an opposite view of the question. The veterinary surgeon gives a hasty opinion, and one which proves to be incorrect. What is now the result? Why, every horseman, both in town and country, is told what has occurred, and even a great deal more, for a story never loses anything by travelling, so that the mistake is not forgotten for a long time, and by some persons it is never effaced from their memory. The professional man is thus made to suffer, while those who possess no knowledge of the art escape censure.

I have penned these few remarks by way of caution to those who are apt to give hasty opinions of their cases. It has been rightly said, "there is no royal road to learning."

CALCULI IN THE KIDNEY OF A COW.

By John Vick, M.R.C.V.S., Gloucester.

Herewith I send you some calculi taken from the kidneys of a cow that died on Friday, May 30th. I had previously

attended her, but never having met with a similar case I thought it might interest your readers. I enclose with the calculi one of the kidneys, which you will perceive contains several small calculi and a large number of cysts.

The kidney from which the calculi were taken was very much enlarged and indurated, weighing about seven pounds. It contained here and there an abscess filled with pus, and one larger than the rest filled with discoloured serum.

I first saw the cow about a fortnight since, and was informed by the herdsman that she had not been thriving quite so fast as the others for some time past. She was labouring under diarrhœa. I told them to place her in a shed and give her a little flour gruel for a day or two, which they did. The diarrhœa ceasing, she was turned out again, being supposed be all right. On Tuesday, the 27th of May, the owner, however, came to me, saying the cow had a stoppage. I gave him an aperient drench, and on the following day I was requested to see her, as she was no better.

On examination I was rather puzzled to account for her symptoms, and told the owner I could not satisfy my mind as to the precise nature of the case, but that I fancied it would terminate badly. The peculiar symptoms were these. The tongue was protruding from the mouth to the extent of about four inches, without there being any apparent local cause for this; there was almost a continual trembling of it and also of the facial muscles; great tenderness was evinced on pressure to the abdomen, and the pulse was scarcely perceptible, either at the jaw or tail; the extremities were cold, and the respiration slow and deep, but the countenance not expressive of much suffering.

The animal would drink, but refused all food. Finding the rectum occupied with hardened fæces, I removed these by the use of an enema and gave her an aperient, combined with a mild diffusible stimulant.

The next morning the ears and legs were much warmer and the symptoms somewhat relieved, but as no action of the bowels had taken place, the enema and aperient were continued.

Although similar means were adopted each day, we could not get the bowels to act. This was the more singular, as after death the contents both of the bowels and stomachs were found in a soft, pultaceous state. All these viscera were also healthy, but the epithelium easily separated from the mucous membrane, both of the rumen and omasum. The kidneys, as previously said, were very much diseased, but there was nothing peculiar to be observed in the condition of her urine.

It appears that a few months since she had an attack of gripes, according to the description given by the man. Did not this depend on the passage of some small calculi from the kidneys into the bladder, causing severe pain and obstructing for the time the passage of the urine?

One of the calculi taken from the kidneys weighed over two drachms, but they were all of small size.

[The kidney sent by Mr. Vick was greatly increased in size and altered in structure. It had evidently been diseased for a long time. As stated by Mr. Vick, in addition to the numerous calculi which it contained, many cysts, filled more or less with a dirty coloured serous fluid, existed in its interior. We could have wished for a more complete history of this case, as it might have assisted in determining the question as to whether the structural changes of the kidneys preceded or not the formation of the calculi. The general conditions of the one sent would rather indicate that such was the case. The calculi, on a chemical analysis, were found to consist of phosphate of lime, with a little carbonate of lime.]

CHEMICAL ANALYSIS.

POISONING BY ARSENIC.

REPLY TO PROFESSOR TUSON'S LETTER.

By J. Harrison, V.S.

Gentlemen,—In the June number of the *Veterinarian* appears a letter from Professor Tuson, of the Royal Veterinary College, censuring the analysis made by my friend, Mr. Walton, and myself, in the case of poisoning by arsenic recorded by me in the pages of the May number of your Journal. In justice to myself and my friend, Mr. Walton, I trust to be allowed the privilege of briefly replying to that gentleman's criticisms. After quoting the first paragraph, and also the first two preliminary tests employed in my report to ascertain if arsenic might be present in the viscera submitted, the author of the letter alluded to goes on to state, in the first place, "that when arsenic is absorbed by the liver, it combines with albuminoid bodies, and consequently becomes insoluble in water (I infer boiling water is meant), and that chemists and toxicologists are in the habit of dissolving out absorbed arsenic from the tissue of an organ by

means of hydrochloric acid, or some other appropriate solvent." Now, admitting that arsenious acid does become combined with albuminoid bodies, in the manner described, and also, under some circumstances—recent cases submitted to analysis—it is absolutely necessary to employ more complex means to demonstrate the presence of the poisonous element in the tissue of an organ impregnated, I contend that in the case submitted in my report it was not, for preliminary purposes, actually necessary.

From the proneness to decomposition of nitrogenous animal organic compounds, and from the fact of their maintaining with so little tenacity their combinations with other elements, is it not natural to suppose that, when exposed, as in this case, for upwards of half a year, to circumstances favorable to spontaneous decomposition, that the albuminoid combination of arsenious acid was resolved, and consequently the poisonous element in question must and was in a state fit for dissolving out with boiling water. It is true that the viscera submitted was in a fair state of preservation, owing, I infer, to the antiseptic properties of arsenious acid and biline, but, notwithstanding, from the amount of fetid gaseous compounds evolved, no one present would have disputed the fact that putrefactive decomposition was not rapidly progressing. In the second place, in the letter referred to it is stated, "that if we succeeded in dissolving out arsenic from the liver, the solution obtained would be so largely contaminated with foreign substances as to render it unfit for the ammonia sulphate of copper and ammonia nitrate of silver tests." The repeatedly filtered solution obtained was certainly slightly (not largely) contaminated; before applying the tests, it seemed apparently quite clear. The precipitates were so characteristic and distinct—soluble in excess of ammonia, with the exception of a slight trace of cloudiness at the bottom of the tube—that even the unpractised eye could scarcely have mistaken them; from this fact, then, gentlemen, I contend that in this case, for preliminary purposes, it was expedient to apply the ammonia sulphate of copper and ammonia nitrate of silver tests. The two next tests employed are stated to be quite new to Professor Tuson, and in reference to which it is said that the third test employed, viz., "chloride of calcium," does not give any precipitate with an aqueous solution of arsenious acid. This circumstance we were quite aware of, but by adding a single drop of ammonia to an aqueous solution of arsenious acid, as used in the laboratory for demonstrative purposes, the white precipitate, the arsenite of lime, is instantly developed. From

this fact, and from the ammoniacal gaseous compounds evolved from an aqueous solution of a liver impregnated with arsenious acid, and undergoing spontaneous decomposition, I say, that chloride of calcium is a proper and delicate test, forming a soluble chloride of ammonium and a precipitate of arsenite of lime. The criticism applied to the fourth test in my paper is confined to the assertion that it is never used by chemists, even as a corroborative test for arsenious acid, being liable to so many sources of error. Chemists and toxicologists are generally agreed that, singly, any one of the tests previously mentioned is liable to sources of error; but when they all corroborate one another, as in this case, very grave suspicion ought to exist in the mind of the analyst that arsenious acid is present. In the next place, in the letter alluded to, Reinsch's test, as described in my paper, is admitted as reliable evidence as to the presence of arsenic in the tissue of the organ submitted, but it is further remarked, in the same paragraph, that I did not state whether the sublimate obtained by heating the copper coated with a dark, steel-gray crust, was crystalline or amorphous. I may be allowed to state that the crystals were observed, and the omission of the word crystalline in my paper is due to me. Still further on, in the same paragraph, Professor Tuson applies a direct inference that no green precipitate (Scheele's green) was developed from the solution of the sublimate being treated with ammonio-sulphate of copper, as the solution contained free acid. To this conclusion I (to use Professor Tuson's own words) need only remark, that the drop or two of free acid was driven off by heat over the flame of a spirit lamp, which was applied for that purpose and for hastening the solution; but supposing the green precipitate had not developed itself on the solution being treated with that reagent, we could have got over the little difficulty by adding a single drop or two of a dilute solution of caustic potash. This brings me to the concluding paragraph in Professor Tuson's letter, where he expresses himself to the effect, "that the incorrect manner in which the chemical analysis, as described in my paper, was conducted, had been the cause of troubling you with the remarks in his letter, and also, as Professor of Chemistry to the English Veterinary College, he should have been omitting a duty had he remained silent on so important a matter, and one in which the liberty of the subject may possibly become involved. In reply to these assertions, and with due respect to Professor Tuson, in the high and honorable position he stands, I think, if he had looked over the history of the case, as recorded in my paper, and had taken into consideration the time that

had elapsed between the death of the animal and the exhuming the viscera for the purpose of submitting it to analysis, and also the circumstances under which it was effected whilst under the soil for upwards of half a year, they being extremely favorable to spontaneous decomposition, and a resolution of the atoms of an animal nitrogenous combination with arsenious acid, he would have come to the conclusion that there was not so much ground for engaging in criticism as a superficial view of the report suggested. However, as I am not prejudiced by either a controversial spirit or a party feeling, I must leave Professor Tuson to form his own opinion as to the correctness or incorrectness of any chemical analysis which may be recorded in the pages of your journal. My paper was submitted to you for publication as an authentic statement of the facts contained in it, and simply with the view that it might perhaps be of service to some of your numerous readers who belong to the profession generally, in drawing their attention to an evil, either malicious or accidental, which I fear is but of too frequent occurrence, and which requires to be checked in its progress. I am, Gentlemen,

Yours obediently.

To the Editors of the 'Veterinarian.'

[On the receipt of the above communication we handed it to our colleague, Professor Tuson, whose reply we now insert. With this, the correspondence must cease.—Eds.]

REJOINDER BY PROFESSOR TUSON.

Dear Sirs,—Having read, at your request, Mr. Harrison's last letter, in which he attempts to vindicate the methods of analysis adopted by him, as described in the May number of the *Veterinarian*, I am induced to ask the insertion of the following remarks in the next number of your journal.

In reply to the statements made in the letter referred to, extending from line 10, p. 143, to line 24, I beg to state that whether the animal tissue existed under "circumstances favorable to spontaneous decomposition," or whether it "was in a fair state of preservation," water was a most inappropriate solvent. An aqueous solution of the liver, although filtered a thousand times, and although perfectly transparent and colourless, would, in consequence of the organic matter which it contained *in solution*, be unsuited for the application of the ammonio-nitrate of silver, and ammonio-sulphate of copper tests. These two reagents would give precipitates in an aqueous so-

lution containing organic matter, even although arsenious acid be absent. With reference to Mr. Harrison's remarks, justifying the employment of chloride of calcium, and a mixture of caustic potash and sulphate of copper as tests for arsenic,and to his observation respecting the addition of caustic potash to get over the "little difficulty," as he terms it, of obtaining a precipitate by ammonio-sulphate of copper, in a solution of arsenious acid, containing free hydrochloric acid, I need only repeat that which I stated in my last letter; viz., that the first two tests are valueless, even as corroborative ones, for arsenious acid, in consequence of the innumerable sources of error to which they are subject; and that very much greater and more numerous precautions have to be observed in order to obtain a precipitate which can be sworn to as Scheele's green, than apparently Mr. Harrison fancies to be necessary.

As I do not wish Mr. Harrison to think that it is either pleasing or satisfactory to me to criticise his chemical knowledge; I may here observe that it would afford me the greatest pleasure if I could see veterinary surgeons practically applying for themselves that science which I have made my profession, and in the pursuit of which I find such inexhaustible sources of gratification and delight.

Feeling that, as hitherto, I have done scarcely anything else than take objection to Mr. Harrison's mode of conducting his investigation for the discovery of arsenic, it will now, I think, be only fair for me to conclude this letter by giving an outline of the most reliable processes employed by the most eminent toxicologists of the present day for the detection of that poison in an organ.

Reinsch's process.—Cut up the organs to be examined into small pieces; cover these with one part of strong hydrochloric acid and two parts of distilled water, and boil the mixture until no more of the tissue can be dissolved. Strain the fluid thus produced through fine muslin, and boil it with strips of bright copper. Remove the strips of copper, now coated with an iron-gray deposit of metallic arsenic, from the fluid, dry them thoroughly, and heat them trongly in a German glass test-tube. A sublimate of arsenious acid will form towards the upper, and upon the cool parts of the test-tube. This sublimate, when examined by the microscope, will be found to consist of a collection of octahedral crystals, or of forms derived from the octahedron.

The crystalline sublimate of arsenious acid should be transferred to a clean test-tube, boiled with distilled water, divided into four portions, and examined thus:

1st Portion. The addition of ammonio-nitrate of silver, which produces a yellow precipitate.

2nd Portion. The addition of ammonio-sulphate of copper, which produces a green precipitate.

3rd Portion. The addition of hydrosulphuric acid and a drop of hydrochloric acid, which produces a yellow precipitate.

4th Portion. This should be examined by Marsh's test, the details of which Mr. Harrison is no doubt familiar with.

Another remarkably good process is to cut up the parts to be examined into very small pieces, to cover them with the strongest hydrochloric acid, and to allow the mixture thus formed to stand in a warm place for twenty-four hours. At the end of this time the mixture is to be placed in a retort and distilled to dryness. The liquid which condenses in the receiver will contain arsenic if that body existed in the tissues under examination, the presence of which may be demonstrated by submitting the distilled liquid to Marsh's test. The two processes just described are those upon which the greatest reliance is now placed, and they are both valuable, especially Reinsch's, from their enabling one to apply the tests for arsenic to liquids *free from admixture with organic matter,* a circumstance to which chemists attach the greatest importance, and to which Mr. Harrison appears to attach little or no value. I am, yours faithfully.

To the Editors of 'The Veterinarian.'

"PROPOSED EXAMINATION OF VETERINARY PRACTITIONERS."

By "One of Them."

Gentlemen,—As there is great discussion now going on, on the point of distinction between qualified and unqualified practitioners, I trust, with many others, that a bye-law will be passed to enable unqualified practitioners to go up for examination. There are a great many useful and intelligent men of this class, who could neither spare time nor money to attend the required lectures at the College. Men who are so much respected by their employers that these would not even think of rejecting their services because they were not in possession of a diploma; and men who would gladly accept the opportunity of being practically examined, and who, if they passed the ordeal, would be at once distinguished from the mere pretender.

I trust, therefore, that such a law will be put in force, that these men may have a chance of having their capabilities tested. I am, gentlemen,

"One of Them."

Facts and Observations.

HYDROPHOBIA IN FRANCE AND PRUSSIA.

In the hope of checking the prevalence of hydrophobia in France, an impost on dogs was imposed in 1855. The number of these animals did not, however, diminish much, their average number in Paris being about 60,000; and so far from that of the cases of hydrophobia having decreased, they have not been so numerous during twenty years as for the last three years. The most effectual means of preventing dogs biting, and thereby communicating the disease, seems to be muzzling them; and M. Renault, the distinguished veterinarian, in a communication to the Academy of Sciences, states that the assertion that muzzling dogs, by the constraint it produces, is itself a cause of rabies, is utterly unsupported by any well-established facts. On the other hand, he points out the results which have been obtained in Berlin from a general and permanent muzzling of all dogs not tied up at home. A tax had already been imposed with no diminution of the number of cases of hydrophobia, when in 1854 the muzzling was ordered and strictly executed upon all dogs not tied up. From the year 1845 to 1853 inclusive, 278 cases of rabies (nearly 28 per annum) were verified at the Berlin Veterinary School; while from 1854 to 1861 inclusive only nine cases have occurred, and none of these since 1856. The conclusions which M. Renault draws from these facts are, that spontaneous rabies is of very rare occurrence, and that permanent and general muzzling of dogs is a highly efficacious means of preventing the propagation of the disease.—*Medical Times.*

MUZZLING OF DOGS IN PARIS.

A case of hydrophobia having occurred in one of the barracks, strict orders have been issued for a general muzzling of dogs, which has been found a complete preventive of this occurrence in Berlin. A terrible accident recently also befel the wife of the venerable M. Bully, formerly President of the Academy of Medicine. A furious dog fell upon her and bit her, inflicting very severe wounds. She was, however, almost convalescent, when one day she expired

almost suddenly; no symptoms of hydrophobia having exhibited themselves, and nothing indicating that the animal was the subject of rabies.—*Medical Times.*

RENAULT ON VENTILATION.

At a recent discussion at the Paris Academy of Medicine, M. Renault remarked that "his experience derived from observation among animals, might be advantageously detailed. He wished to exhibit the influence which absence of due ventilation exerts on animals in a state of health and when diseased. The great mortality occurring amongst the horses of the French cavalry has been diminished by more than one-half by increasing the amount of air supplied to the stables, no other change in the management having occurred. At the end of the Italian war, 10,000 cavalry were left with no other stabling but mere temporary sheds, but the mortality was quite insignificant, and not a single case of glanders occurred. The French government are now trying some experiments with respect to the results of the exposure of horses even to currents of air, some of the results having proved of a most favorable kind. As might be expected, the effects of the improved ventilation of stables has been still more fully exhibited with respect to sick and wounded horses." Of this M. Renault adduces numerous examples, the general result of the improvements being a great diminution of disease, a greater amount of curability, and a far less proportion of diseases of a grave character.—*Medical Times.*

CURE OF GANGRENE.

At the last meeting of the Académie des Sciences, Dr. Langier sent in a paper on a new mode of treating gangrene. It having been ascertained by Dr. Reveil that gangrene is occasioned by the diminution or total elimination of the oxygen necessary to maintain the vitality of the part attacked, Dr. Langier conceived the idea of keeping gangrenous parts immersed in an atmosphere of oxygen constantly renewed. The two cases treated by him in this manner have both ended in a complete cure, although the age of each patient exceeded seventy-four years.—*Lancet.*

A PORTABLE STYPTIC.

For the preparation of a convenient styptic, it is recommended by the *Moniter des Sciences Médicales* to soak amadou or German tinder in a solution of perchloride of iron of a density of about 1.250. It should then be dried in the sun, and rubbed between the hands to restore its suppleness and porosity. Small pieces applied to leech bites soon stop their bleeding. They may be held in their places by strips of plaster.—*Lancet.*

TEST FOR POISONOUS PAPER HANGINGS.

Common spirits of hartshorn or ammonia is a very sure and easy test for arsenic. On application, the beautiful but dangerous green turns to a decided blue.—*Lancet.*

POISONING BY ARSENICAL SHEEP-DIPPING MIXTURE.

A letter from Rugby, under the date July 12th, contains an account of ten persons having been poisoned at Ashby St. Ledgers, a village on the borders of Northamptonshire.

It appears that Mr. W. P. Cowley, a farmer, living with his mother (a widow) and his brothers, had his sheep dipped or washed, last week, in a strong mixture of arsenic and soft soap, diluted with water. On Tuesday week Mr. Cowley sent his brother, Mr. E. Cowley, to Daventry, where he purchased 6lb. of arsenic and a barrel of soft soap, weighing 30lb. On the following morning Mr. W. P. Cowley and his mother prepared the sheep-dipping mixture, in which some lambs were washed. In this operation Mr. Cowley and several of his labourers were employed.

After assisting her son in the preparation of the soap and arsenic, Mrs. Cowley proceeded to make a batter pudding for the dinner of her family and the labourers and servants. By some means, as yet unaccounted for, arsenic became mixed with the pudding, and the whole of the persons who partook of it, ten in number, became violently sick just after dinner, and exhibited all the symptoms of being poisoned.

The best medical assistance in the neighbourhood was procured, but one man died, and another is not expected to survive; the others are all more or less affected. The name of the deceased is Richard Smith, an agricultural labourer fifty-three years of age.

THE VETERINARIAN, AUGUST 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

THE ESTABLISHMENT OF A VETERINARY PROTECTION SOCIETY.

In another part of our journal will be found a communication from Professor Brown, recommending the formation of a society for the protection of the members of the profession against vexatious legal proceedings for supposed want of professional ability in the treatment of animals committed to their care. This is a very important subject, and being thus revived, we trust it will receive a better fate than it did before.

Our readers will remember that Mr. Varnell, as long since as 1857, drew attention to the injustice which had often to be borne by veterinary surgeons, in consequence of the disappointed hopes of their employers, and he advocated as a preventive measure, the establishment of "an institution to be designated *The Veterinary Protection Society.*" See page 8, vol. xxx. At that time we penned some remarks fully approving of the measure, which are equally applicable to the present occasion. As we hope, however, soon to return to this subject, we will not now repeat the arguments then used, but content ourselves by quoting the last paragraph of the article in question.

"We echo Mr. Varnell's solicitation that others in the profession will give the subject the consideration it merits, and favour us with their opinions. Ours is now known to them, from which it will be inferred that we give to the scheme our hearty concurrence."

THE METROPOLITAN MEETING OF THE ROYAL AGRICULTURAL SOCIETY.

The great demand made on our space this month, through the Metropolitan meeting of the Royal Agricultural Society, and also by the proceedings of its Council on the subject of Splenic Apoplexy in cattle, has called for the publication of a *double* number of our journal. This, we trust, will prove not unacceptable to our readers, while it is to us a source of gratification, seeing that so much important matter is at our disposal. The meeting of the Society may, in every respect, save one, be rightly described as a great success. Never were so many valuable animals, or such splendid specimens of implements of husbandry collected together in one focus. The exhibition was, indeed, the wonder of the Foreigner, and the pride of the Englishman.

Strange to say that, in the centre of our national wealth and industry, the exception to complete success should have been in the amount of money received from the visitors; not that Londoners lacked interest in the exhibition, but that the site of it was reached with too much difficulty, and at the expenditure of too great a proportion of their time. The total expenditure of the Society was not less than fifteen thousand pounds, while the receipts only amounted to about twelve thousand, so that the going south of the Thames has caused the loss of a very large sum, although Battersea park was in itself all that could be desired for the show, and every one was more than gratified when once he had arrived within its boundaries. It is satisfactory, however, to know that this loss will in no way damp the ardour of the Society, nor impair its future usefulness, and next year we hope to record that its coffers have again been fully replenished by its visit to Worcester.

As our readers are aware, the meeting was not only Metropolitan, but International; hence in addition to our English breeds of horses cattle, sheep, and pigs, Scotland, through her "Highland and Agricultural Society," sent the best specimens of her stock, which were in themselves a

splendid collection of animals. Ireland and Wales contributed a small proportion only, while the Channel Islands were fairly represented as to number, as were France, Holland, Switzerland, and several of the German states.

Apart from the rest of the show, the animals alone occupied nearly two miles of shedding. To criticise the merits of individual animals, even in one division, would therefore be no easy task, could we find space for such a purpose, in this our double number. Speaking in general terms, the horses were the weakest part of the show in point of merit, notwithstanding that there were many splendid animals among them, particularly in the cart-horse classes. We could have wished to have seen a far better selection of hunters; as those sent could hardly have impressed the foreigner with a belief in the dashing feats that are performed in the hunting-field, of which he hears so much. Our ideas also had wandered over a strong gathering of superior thorough-breds, and we confess to a disappointment in not seeing a more spirited competition both for the £100 prize, and also for the one for the best stallion for getting hunters.

The cattle were superb. Of the 646 entries, no less than 241 consisted of short-horns. All the bull classes of this breed received the commendation of the judges, and perhaps rightly enough. The gold medal in the male class was won by a ten months, two weeks, and four days old calf, "*First Fruit*," the property of Mr. Jonas Webb, of Babraham. The circumstance of a calf beating the first prize yearling, two years old, and aged bull in a competition, is, we believe, without precedent, and it was consequently very satisfactory to find that the voice of the general public went with the judges.

In the female classes of short-horns, the Booth blood was pre-eminent, bearing away almost all the prizes. The gold medal was won by Mr. Booth's cow "Queen of the Ocean," aged three years, seven months, and twenty-five days.

The numerical strength of both the Herefords and the Devons was greater than it has been for some years; while the specimens exhibited were never surpassed in quality.

We must refer our readers to the appended list of prizes for the awards in these classes, as also in all the others, for the reasons which have been before advanced.

The show of Sussex cattle was excellent, as was likewise that of the "Norfolk and Suffolk polled" breed. Many of the latter have most of the good qualities of the Devons, to which race they would seem to have a strong family union, but for their want of horns. A few good "long-horns" were shown, and also some neat specimens of the Irish Kerries. The Welch were very feebly represented, but of fair average quality.

We own to a disappointment in the Channel Islands cattle; for when we look at the important question of milk, and know in what deservedly high estimation the Alderneys are held, we are the more surprised that better specimens were not exhibited. Although strong in number, the class contained but few good animals. We have already spoken of the general superiority of the Scotch stock, and would include in this remark not only the horses and cattle, but likewise the mountain-sheep. In comparing the milk producing Ayrshires with the Alderneys, we may point with pride to those of Scotia. Rarely have we seen more beautiful or perfect animals of their kind.

Of the foreign breeds we cannot now say much. France failed to send us anything like the number which was expected. Only two Charolaise, male and female, were exhibited; but these were certainly very fine specimens of that superior meat-producing race, which our neighbours have learnt how best to turn to advantage. A single Garronaise bull was shown, which, however, may be rightly called a good animal. The Norman race was well represented by quality, if not, indeed, by quantity. The Pyrenean and other French breeds, apart from the pretty little Bretons, were only second-rate animals. The Bretons mustered in strong force, and, if not thought much of by our short-horn, Hereford, or Devon men, were certainly in high favour with the ladies.

The Flemish and Dutch breeds fully supported their position. The chief feature, however, among the foreign cattle,

was the beautiful collection of Swiss cows. So strong in force were they that the stewards rightly decided to separate them into two classes—"the brown, and the coloured"—and give prize medals for each. Throughout the entire show they formed one of the chief sources of attractiou, bedecked as they were with their fine-toned bells, chiming a musical accompaniment to the celebrated *ranz des vaches* of their attendants. With this we must close our description of the cattle, having exceeded our utmost limit of space, and pass on to say one word respecting the sheep and pigs.

The several classes of both these descriptions of stock fully supported their established fame. The Cotswold exhibitors came out in great strength, and, we hope, have thereby settled their little difference with the Society. The Southdowns were also very good, and now that Mr. Jonas Webb has retired, with his honours thick upon him, we suppose that we shall see Mr. Rigden occupying the vacant place, with now and then an order to "stand aside" for my Lord Walsingham. As wool-producing animals, none could compare with the Merinos. According to report, a French Merino ram was sold for 100 guineas, and three Saxon Merinos for 600 guineas; the latter being destined for Australia.

Of the pigs we can only say that, with the exception of the Berkshire, we never remember to have seen them better.

In concluding this hasty summary we may congratulate our profession on the advantages which the country is deriving from a veterinary inspection of the animals exhibited at our various agricultural shows. In this large collection, apart from the horses, only *one* animal had to be disqualified in consequence of hereditary disease. Some few pigs were rejected for over age; and, notwithstanding the examples which have been made, one exhibitor in particular had the temerity to show three pens of pigs which exceeded the age stated in the certificates of entry.

For future reference to this, the first great Metropolitan Show of the Royal Agricultural Society of England, we give, in full, the award of prizes.

AWARD OF PRIZES FOR HORSES, CATTLE, SHEEP, AND PIGS,

At the International Show of the Royal Agricultural Society of England, held in Battersea Park, 1862.

CATTLE.

SHORT-HORNED.

Class I.—*To the owner of the best Bull, calved on or before the* 1*st of July*, 1859, *above three and under six years old.*

First prize of £30 to No. 14, John Wood, of Stanwick Park, Darlington, Yorkshire.

Second prize of £15, to No 20, James Haughton Langston, M.P., of Sarsden House, Chipping Norton, Oxfordshire.

Third prize of £5 to No. 3, William Hosken and Son, of Loggans Mill, Hayle, Cornwall.

Class II.—*To the owner of the best Bull, calved* since *the* 1*st of July*, 1859, *above two and under three years old.*

First prize of £30 to No. 46, William Stirling, M.P., of Keir, Dunblane, Perth.

Second prize of £15 to No. 29, Henry Ambler, of Watkinson Hall, Halifax, Yorkshire.

Third prize of £5, to No. 33, Arthur James Balfour, of Whittingham, Prestonkirk, Haddington.

Class III.—*To the owner of the best Bull, calved* since *the* 1*st of July*, 1860, *above one and under two years old.*

First prize of £25 to No. 63, Stewart Marjoribanks, of Bushey Grove, Watford, Herts.

Second prize of £15 to No. 92, Lieut.-Col. Towneley, of Towneley Park, Burnley, Lancashire.

Third prize of £5 to No 58, Henry Ambler, of Watkinson Hall, Halifax, Yorkshire.

Class IV.—*To the owner of the best Bull-Calf, above six and under twelve months old.*

First prize of £15 to No. 113, Jonas Webb, of Babraham, Cambridge.

Second prize of £10 to No. 99, Thomas Edward Pawlett, of Beeston, Sandy, Beds.

Third prize of £5 to No. 103, Joseph Robinson, of Clifton Pastures, Newport Pagnell, Bucks.

The above four Classes generally Commended.

Class V.—*To the owner of the best Cow, above three years old.*

First prize of £20 to No. 144, Richard Booth, of Warlaby, Northallerton, Yorkshire.

Second prize of £10 to No. 165, Lady Pigot, of Branches Park, Newmarket, Suffolk.

Third prize of £5 to No. 151, Jonas Webb, of Babraham, Cambridge.

Class VI.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

First prize of £15 to No. 167, The Duke of Montrose, of Buchanan, Glasgow.

Second prize of £10 to No. 179, John Lane, of Barton Mills, Cirencester, Gloucester.

Third prize of £5 to No. 168, Lord Feversham, of Duncombe Park, Helmsley, Yorkshire.

Highly Commended.—No. 171, James Douglas, of Athelstaneford Farm, Drem, Haddingtonshire.

Commended.—No. 170, James Douglas, of Athelstaneford Farm, Drem, Haddingtonshire. No 175, John Wood, of Stanwick Park, Darlington, Yorkshire. No. 176, William Hewer, of Sevenhampton, Highworth, Wilts. No. 181, Lieut.-Col. Towneley, of Towneley Park, Burnley, Lancashire.

Class VII.—*To the owner of the best Yearling Heifer.*

First prize of £15 to No. 190, Richard Booth, of Worlaby, Northallerton, Yorkshire.

Second prize of £10 to No. 224, Lieut.-Col. Towneley, of Towneley Park, Burnley, Lancashire.

Third prize of £5 to No. 188, Lord Feversham, of Duncombe Park, Helmsley, Yorkshire.

Highly Commended.—No. 192, Thomas Atherton, of Chapel House, Speke, Garston, Lancashire.

Commended.—No. 191, Edward Lawford, of Linslade, Leighton Buzzard, Bucks. No. 194, Stewart Marjoribanks, of Bushey Grove, Watford, Herts. No. 196, Stewart Marjoribanks, of Bushey Grove, Watford, Herts. No. 197, Stewart Marjoribanks, of Bushey Grove, Watford, Herts. No. 199, The Hon. and Rev. Thomas Henry Noel Hill, of Berrington, Shrewsbury, Salop. No. 200, Charles Howard, of Biddenham, Beds. No. 222, Lieut.-Col. Towneley, of Towneley Park, Burnley Lancashire. No. 226, Lady Pigot, of Branches Park, Newmarket, Suffolk.

Class VIII.—*To the owner of the best Heifer-Calf, above six and under twelve months old.*

First prize of £15 to No. 250, J. R. Middleborough, of South Milford, Yorkshire.

Second prize of £10 to No. 237, James Douglas, of Athelstaneford Farm, Drem, Haddingtonshire.

Third prize of £5 to No. 236, Joseph Robinson, of Clifton Pastures, Newport Pagnell, Bucks.

Highly Commended.—No. 249, Lady Pigot, of Branches Park, Newmarket, Suffolk.

To the owner of the best Male *Animal in the Short-horned Classes.*

Gold medal to No. 113, Jonas Webb, of Babraham, Cambridge.

To the owner of the best Female *Animal in the Short-horned Classes.*

Gold Medal to No. 144, Richard Booth, of Warlaby, Northallerton, Yorkshire.

HEREFORD.

Class I.—*To the owner of the best Bull, calved on or before the* 1*st of July,* 1859, *above three and under six years old.*

First prize of £30 to No. 253, The Hon. Col. Hood, of Cumberland Lodge, Windsor Park.

Second prize of £15, to No. 257, Thomas Davis, of Burlton Court, Hereford.

Third prize of £5 to No. 255, John Naylor, of Leighton-hall, Welshpool, Montgomery.

Commended.—No. 256, Charles Vevers, of Ivington Park, Leominster, Hereford.

Class II.—*To the owner of the best Bull, calved* since *the* 1*st of July*, 1859, *above two and under three years old.*

First prize of £30 to No. 260, Richard Hill, of Golding-hall, Shrewsbury, Salop.

Second prize of £15 to No. 265, R. Harcourt Capper, of the Northgate, Ross, Hereford.

Third prize of £5 to No. 267, Thomas Duckham, of Baysham Court, Ross, Herefordshire.

The Class Commended.

Class III.—*To the owner of the best Bull, calved* since *the* 1*st of July*, 1860, *above one and under two years old.*

First prize of £25, to No. 275, James Taylor, of Stretford Court, Leominster, Herefordshire.

Second prize of £15 to No. 279, John Naylor, of Leighton-hall, Welshpool, Montgomery.

Third prize of £5 to No. 284, William Taylor, of Showle Court, Ledbury, Hereford.

Commended.—No. 271, James Marsh Read, of Elkstone, Cheltenham, Gloucester.

Class IV.—*To the owner of the best Bull-Calf, above six and under twelve months old.*

First prize of £15 to No. 292, Charles Vevers, of Ivington Park, Leominster, Hereford.

Second prize of £10 to No. 295, Philip Turner, of The Leen, Pembridge, Leominster, Hereford.

Third prize of £5 to No. 289, William Tudge, of Adforton, Leintwardine, Herefordshire.

Commended.—No. 287, James Taylor, of Stretford Court, Leominster, Herefordshire. No. 288, James Taylor, of Stretford Court, Leominster, Herefordshire. No. 286, Thomas Roberts, of Ivington, Bury, Leominster, Hereford.

Class V.—*To the owner of the best Cow, above three years old.*

First prize of £20 to No. 303, Henry Coate, of Sherborne, Dorset.

Second prize of £10 to No. 301, George Pitt, of Chadnor Court, Dilwyn, Leominster, Hereford.

Third prize of £5 to No. 306, R. Harcourt Capper, of the Northgate, near Ross, Hereford.

The Class Commended.

Class VI.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

First prize of £15 to No. 310, James Marsh Read, of Elkstone, Cheltenham, Gloucester.

Second prize of £10 to No. 317, William Tudge, of Ardforton, Leintwardine, Herefordshire.

Third prize of £5 to No. 315, Henry Rawlings Evans, Jun., of Swanstone Court, Dilwyn, Leominster.

Commended.—No. 319, James Rea, of Monaughty, Knighton, Radnorshire.

Class VII.—*To the owner of the best Yearling Heifer.*

First prize of £15 to No. 323, The Hon. Col. Hood, of Cumberland Lodge, Windsor Park.

Second prize of £10 to No. 326, John Naylor, of Leighton-hall, Welshpool, Montgomery.

Third prize of £5 to No. 325, Thomas Thomas, of St. Hilary, Cowbridge, Glamorganshire.

The Class Commended.

Class VIII.—*To the owner of the best Heifer-Calf, above six and under twelve months old.*

First prize of £15 to No. 343, John Baldwin, of Luddington, Stratford-on-Avon, Warwickshire.

Second prize of £10 to No. 338, James Marsh Read, of Elkstone, Cheltenham, Gloucester.

Third prize of £5 to No. 336, William Perry, of St. Oswalds, Cholstrey, Leominster, Hereford.

Class Commended.

To the owner of the best Male *Animal in the Hereford Classes.*

Gold Medal to No. 260, Richard Hill, of Golding-hall, Shrewsbury, Salop.

To the owner of the best Female *Animal in the Hereford Classes.*

Gold Medal to No. 303, Henry Coate, of Sherborne, Dorset.

DEVON.

Class I.—*To the owner of the best Bull, calved on or before the 1st of July,* 1859, *above three and under six years old.*

First prize of £30 to No. 349, James Davy, of Flitton Barton, North Molton, Devon.

Second prize of £15 to No. 350, Samuel Pomeroy Newbery, of Scruel Barton, Honiton, Devon.

Third prize of £5 to No. 351, T. and J. Palmer, of Norton Stoke Clinsland, Callington, Cornwall.

Highly Commended.—No. 348, the Hon. Col. Hood, of Cumberland Lodge, Windsor Park.

Class II.—*To the owner of the best Bull, calved* since *the 1st of July,* 1859, *above one and under three years old.*

First prize of £30 to No. 354, Walter Farthing, of Stowey Court, Bridgewater, Somerset.

Second prize of £15 to No. 353, John Bodley, of Stockley Pomeroy, Crediton, Devon.

Third prize of £5 to No. 355, William Herbert Wodehouse, of Woolmers Park, Hertfordshire.

Class III.—*To the owner of the best Bull, calved* since *the 1st of July,* 1860, *above one and under two years old.*

First prize of £25 to No. 356, the Hon. Col. Hood, of Cumberland Lodge, Windsor Park.

Second prize of £15 to No. 357, James Merson, of Brinsworthy, North Molton, Devon.

Third prize of £5 to No. 358, Walter Farthing, of Stowey Court, Bridgewater, Somerset.

Class IV.—*To the owner of the best Bull-Calf, above six and under twelve months old.*

First prize of £15 to No. 361, the Hon. Col. Hood, of Cumberland Lodge, Windsor Park.

Second prize of £10 to No. 369, George Turner, of Beacon Downes, Exeter.

Third prize of £5 to No. 366, George Turner, of Beacon Downes, Exeter.

Highly Commended.—No. 367, Walter Farthing, of Stowey Court, Bridgewater, Somerset.

Class V.—*To the owner of the best Cow, above three years old.*

First prize of £20 to No. 372, James Davy, of Flitton Barton, North Molton, Devon.

Second prize of £10 to No. 375, George Turner, of Beacon Downes, Exeter, Devon.

Third prize of £5 to No. 380, John Azariah Smith, of Bradford Peverill, Dorchester.

Highly Commended.—No. 381, George Turner, of Beacon Downes, Exeter, Devon.

Commended.—No. 371, James Merson, of Brinsworthy, North Molton, Devon. No. 374, Edward Pope, of Great Toller, Maiden Newton, Dorset. No. 376, George Turner, of Beacon Downes, Exeter, Devon. No. 378, Walter Farthing, of Stowey Court, Bridgewater, Somerset. No. 379, Walter Farthing, of Stowey Court, Bridgewater, Somerset.

Class VI.—*To the owner of the best Heifer in-milk, or in-calf, under three years old.*

First prize of £15 to No. 385, William Paull, of Piddletown, Dorchester.

Second prize of £10 to No. 386, James Merson, of Brinsworthy, North Molton, Devon.

Third prize of £5 to No. 387, James Merson, of Brinsworthy, North Molton, Devon.

Highly Commended.—No. 384, William Paull, of Piddletown, Dorchester.

Class generally Commended.

Class VII.—*To the owner of the best Yearling Heifer.*

First prize of £15 to No. 397, James Davy, of Flitton Barton, North Molton, Devon

Second prize of £10 to No. 398, James Davy, of Flitton Barton, North Molton, Devon.

Third prize of £5 to No. 396, James Merson, of Brinsworthy, North Molton, Devon.

Highly Commended.—No. 392, William Hole, of Hannaford, Barnstaple, Devon.

The Class Commended.

Class VIII.—*To the owner of the best Heifer-Calf, above six and under twelve months old.*

First prize of £15 to No. 403, James Davy, of Flitton Barton, North Molton, Devon.

Second prize of £10 to No. 413, Sir Alexander Acland Hood, of St. Audries, Bridgewater, Somerset.

Third prize of £5 to No. 412, Sir Alexander Acland Hood, of St. Audries, Bridgewater, Somerset.

Highly Commended.—No. 411, George Turner, of Beacon Downes, Exeter, Devon.

The Class Commended.

To the owner of the best Male *Animal in the Devon Classes.*

Gold Medal to No. 349, James Davy, of Flitton Barton, North Molton, Devonshire.

To the owner of the best FEMALE *Animal in the Devon Classes.*

Gold Medal to No. 372, James Davy, of Flitton Barton, North Molton, Devon.

SUSSEX.

CLASS I.—*To the owner of the best Bull, calved on or before the* 1*st of July,* 1859, *under six years old.*

First prize of £15 to No. 414, William Botting, of Westmeston Place, Hurstpierpoint, Sussex.

Second prize of £5 to No. 416, George Jenner, of Parsonage House, Udimore, Rye, Sussex.

Highly Commended.—No. 415, William Botting, of Westmeston Place, Hurstpierpoint, Sussex.

CLASS II.—*To the owner of the best Bull, calved since the* 1*st of July,* 1859, *and more than one year old.*

First prize of £10 to No. 418, John and Alfred Heasman, of Angmering, Arundel, Sussex.

Second prize of £5 to No. 422, William Marshall, of Bolney Place, Cuckfield, Sussex.

CLASS III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 425, Richard Woodman, of Glynde, Lewes, Sussex.

Second prize of £5 to No. 429, Tilden Smith, of Knelle Beckley, Staplehurst, Sussex.

Highly Commended.—No. 424, George Jenner, of Parsonage House, Udimore, Rye, Sussex.

CLASS IV.—*To the owner of the best Heifer, in milk, or in-calf, under three years old.*

First prize of £10 to No. 430, John and Alfred Heasman, of Angmering, Arundel, Sussex.

Second prize of £5 to No. 431, George Jenner, of Parsonage House, Udimore, Rye, Sussex.

Highly Commended.—No. 432, George Jenner, of Parsonage House, Udimore, Rye, Sussex.

CLASS V.—*To the owner of the best Yearling Heifer.*

First prize of £10 to No. 436, John and Alfred Heasman, of Angmering, Arundel, Sussex.

Second prize of £5 to No. 438, Richard Woodman, of Glynde, Lewes, Sussex.

Commended.—No. 439, Richard Woodman, of Glynde, Lewes, Sussex.

LONG-HORNED.

CLASS I.—*To the owner of the best Bull, calved on or before the* 1*st of July,* 1859, *under six years old.*

First prize of £15 to No. 445, Lieutenant-Colonel Wm. Inge, of Thorpe Constantine, Tamworth, Staffordshire.

Second prize of £5 to No. 444, William Thomas Cox, of The Hall, Spondon, Derby.

CLASS II.—*To the owner of the best Bull, calved since the* 1*st of July,* 1859, *and more than one year old.*

First prize of £10 to No. 446, James Davis, of Melcombe Horsey, Dorchester, Dorset.

Second prize of £5 to No. 448, Edward Thornton Twycross, of Canley, Coventry, Warwickshire.

CLASS III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 452, Richard Warner, of Weston Hill, Nuneaton, Warwickshire.

Second prize of £5 to No. 450, Lieut.-Col. William Inge, of Thorpe Constantine, Tamworth, Staffordshire.

Highly Commended.—No. 453, Edward Thornton Twycross, of Canley, Coventry, Warwickshire.

CLASS IV.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

First prize of £10 to No. 454, Richard Hemming Chapman, of Upton, Nuneaton, Warwick.

CLASS V.—*To the owner of the best Yearling Heifer.*

First prize of £10 to No. 455, Joseph Holland Burbery, of The Chase, Kenilworth, Warwick.

Second prize of £5 to No. 456, Joseph Holland Burbery, of The Chase, Kenilworth, Warwick.

Commended.—No. 457, Richard Hemming Chapman, of Upton, Nuneaton, Warwick.

NORFOLK AND SUFFOLK POLLED.

CLASS I.—*To the owner of the best Bull, calved on or before the 1st of July, 1859, under six years old.*

First prize of £15 to No. 462, Sir Edward Kerrison, Bart., M.P., of Brome Hall, Scole, Suffolk.

Second prize of £5 to No. 463, John Smith, of Crownthorpe, Wymondham, Norfolk.

Highly Commended.—No. 459, Lord Sondes, of Elmham Hall, Thetford, Norfolk.

Class Commended.

CLASS II.—*To the owner of the best Bull, calved since the 1st of July, 1859, and more than one year old.*

First prize of £10 to No. 465, Samuel Wolton, of Newbourn Hall, Woodbridge, Suffolk.

Second prize of £5 to No. 466, Arthur William Crisp, of Chillesford, Wickham Market, Suffolk.

Commended.—No. 467, Lord Sondes, of Elmham Hall, Thetford, Norfolk.

CLASS III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 471, Sir Edward Kerrison, Bart., M.P., of Brome Hall, Scole, Suffolk.

Second prize of £5 to No. 469, Sir Willoughby Jones, Bart., of Cranmer Hall, Fakenham, Norfolk.

Highly Commended.—No. 468, Lord Sondes, of Elmham Hall, Thetford, Norfolk.

CLASS IV.—*To the owner of the best Heifer in-milk or in-calf, under three years old.*

First prize of £10 to No. 474, Lord Sondes, of Elmham Hall, Thetford, Norfolk.

Second prize of £5 to No. 473, Lord Sondes, of Elmham Hall, Thetford, Norfolk.

Commended.—No. 475, Samuel Wolton, of Newbourn Hall, Woodbridge, Suffolk.

CLASS V.—*To the owner of the best Yearling Heifer.*

First prize of £10 to No. 477, Lord Sondes, of Elmham Hall, Thetford, Norfolk.

Second prize of £5 to No. 482, Sir Edward Kerrison, Bart., M.P., of Brome Hall, Scole, Suffolk.

NORTH WALES.

CLASS I.—*To the owner of the best Bull, calved on or before the 1st of July, 1859, under six years old.*

No Entry.

CLASS II.—*To the owner of the best Bull, calved since the 1st of July, 1859, and more than one year old.*

No Entry.

CLASS III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 486, Richard Hart Harvey, of Harroldstone, Haverfordwest, Pembroke.

Second prize of £5 to No. 485, Richard Hart Harvey, of Harroldstone, Haverfordwest, Pembroke.

CLASS IV.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

No Entry.

CLASS V.—*To the owner of the best Yearling Heifer.*

No Entry.

SOUTH WALES.

CLASS I.—*To the owner of the best Bull, calved on or before the 1st of July, 1859, under six years old.*

No Entry.

CLASS II.—*To the owner of the best Bull, calved since the 1st of July, 1859, and more than one year old.*

First prize of £10 to No. 487, George Brown, of Talbenny Hall, Haverfordwest, Pembroke.

CLASS III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 488, Clare Sewell Read, of Plumstead House, Norwich, Norfolk.

Second prize of £5 to No. 489, Clare Sewell Read, of Plumstead House, Norwich, Norfolk.

CLASS IV.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

First prize of £10 to No. 493, Richard Hart Harvey, of Harroldstone, Haverfordwest, Pembroke.

Second prize of £5 to No. 492, Clare Sewell Read, of Plumstead House, Norwich, Norfolk.

CLASS V.—*To the owner of the best Yearling Heifer.*

First prize of £10 to No. 494, Clare Sewell Read, of Plumstead House, Norwich, Norfolk.

IRISH—KERRY.

Class I.—*To the owner of the best Bull, calved on or before the* 1*st of July,* 1859, *under six years old.*

First prize of £15 to No. 496, John Borthwick, J.P., of Prospect, Carrickfergus, Antrim.

Class II.—*To the owner of the best Bull, calved since the* 1*st of July,* 1859, *and more than one year old.*

First prize of £10 to No. 498, James Smith, of Moyle, Carlow.

Second prize of £5 to No. 497, Ralph Smith Casack, of Bohomer, St. Doulaghs, Dublin.

Class III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 499, Ralph Smith, Cusack, of Bohomer, St. Doulaghs, Dublin.

Second prize of £5 to No. 500, John Borthwick, J.P., of Prospect, Carrickfergus, Antrim.

Class IV.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

First prize of £10 to No. 501, Ralph Smith Cusack, of Bohomer, St. Doulaghs, Dublin.

Second prize of £5 to No. 503, James Smith, of Moyle, Carlow.

Class V.—*To the owner of the best Yearling Heifer.*

First prize of £10 to No. 504, John Borthwick, J.P., of Prospect, Carrickfergus, Antrim.

CHANNEL ISLANDS.

JERSEY, COMMONLY CALLED ALDERNEY.

Class I.—*To the owner of the best Bull, calved on or before the* 1*st of July,* 1859, *under four years old.*

The prize of £10 to No. 507, David Smith, of Browning Hill House, Basingstoke, Hants.

Highly Commended.—No. 506, Albert Le Gallais, of La Moie House, Jersey.

Class II.—*To the owner of the best Bull, calved since the* 1*st of July,* 1859, *and more than one year old.*

The prize of £5 to No. 510, Bartholomew Watts, of Don-street, St. Heliers, Jersey.

Highly Commended.—No. 512, James Dumbrell, of Ditchling, Hurstpierpoint, Sussex.

Commended.—No. 508, Henry C. Compton, of Manor House, Lyndhurst, Hants.

Class III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 516, Fowler Newsam, J.P., of Stamford Hill, Middlesex.

Second prize of £6 to No. 514, John Allnutt, of Clapham, Surrey.

Third prize of £4 to No. 519, Albert Le Gallais, of La Moie House, St. Aubins, Jersey.

Highly Commended.—No. 518, Albert Le Gallais, of La Moie House, St. Aubins, Jersey.

CLASS IV.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

First prize of £10 to No. 525, Albert Le Gallais, of La Moie House, St. Aubins, Jersey.

Second prize of £5 to No. 526, Charles Philip Le Cornu, of Beaumont, Jersey.

Highly Commended.—No. 522, The Rev. William Lemprière, of Rozel Manor, St. Heliers, Jersey.

GUERNSEY.

CLASS I.—*To the owner of the best Bull, calved on or before the* 1*st of July,* 1859, *under four years old.*

The prize of £10 to No. 528, John Rougier, of Golden Spurs, St. Peter's Port, Guernsey.

CLASS II.—*To the owner of the best Bull, calved since the* 1*st of July,* 1859, *and more than one year old.*

The prize of £5 to No. 529, Eldred Beck, of Quevillitte, St. Martin's, Guernsey.

CLASS III.—*To the owner of the best Cow, above three years old.*

First prize of £10 to No. 532, John Allnutt, of Clapham, Surrey.

Second prize of £6 to No. 533, Henry De Jersey Le Lachen, of Norgiots, St. Andrews, Guernsey.

Third prize of £4 to No. 531, Eldred Beck, of Quevillitte, St. Martin's, Guernsey.

CLASS IV.—*To the owner of the best Heifer, in-milk or in-calf, under three years old.*

First prize of £10 to No. 536, John Rougier, of Golden Spurs, St. Peter's Port, Guernsey.

Second prize of £5 to No. 535, John Allnutt, of Clapham, Surrey.

PRIZES

Given by the Highland and Agricultural Society of Scotland.

CATTLE.

POLLED (ABERDEEN AND ANGUS).

CLASS I.—*To the owner of the best Bull, calved before the* 1*st of January,* 1860.

First prize of £20 to No. 538, Thomas Lyell, of Shielhill, Kirrimuir, Forfarshire.

Second prize of £10 to No. 542, The Earl of Southesk, of Kinnaird Castle, Brechin, Forfar.

Third prize of Silver Medal, to No. 539, Thomas Lyell, of Shielhill, Kirriemuir, Forfarshire.

Highly Commended.—No. 543, Robert Walker, of Hillside House, Portlethen, Aberdeen.

CLASS II.—*To the owner of the best Bull, calved after the* 1*st of January,* 1860.

First prize of £20 to No. 547, James Alexander Pierson, of The Guynd, Arbroath, Aberdeen.

Second prize of £10 to No. 544, Robert Farquharson, of Houghton, Alford, Aberdeen.

Third prize of Silver Medal to No. 546, The Earl of Southesk, of Kinnaird Castle, Brechin, Forfar.

Highly Commended.—No. 545, Alew Paterson, of Mulben, Blackhillock, Morayshire.

Class III.—*To the owner of the best Bull, calved after the* 1*st of January*, 1861.

First prize of £10 to No. 550, William McCombie, of Tillyfour, Aberdeen.

Second prize of £5 to No. 548, Thomas Lyell, of Shielhill, Kirriemuir, Forfar.

Third prize of Silver Medal to No. 551, The Earl of Southesk, of Kinnaird Castle, Brechin, Forfar.

Class IV.—*To the owner of the best Cow of any age.*

First prize of £10 to No. 554, William McCombie, of Tillyfour, Aberdeen.

Second prize of £5 to No. 553, William McCombie, of Tillyfour, Aberdeen.

Third prize of Silver Medal to No. 555, The Earl of Southesk, of Kinnaird Castle, Brechin, Forfar.

Class V.—*To the owner of the best Heifer, calved after the* 1*st of January*, 1860.

First prize of £10 to No. 558, William McCombie, of Tillyfour, Aberdeen.

Second prize of £5 to No. 557, William McCombie, of Tillyfour, Aberdeen.

Third prize of Silver Medal to No. 560, The Earl of Southesk, of Kinnaird Castle, Brechin, Forfar.

Highly Commended.—No. 561, Robert Walker, of Hillside House, Portlethen, Aberdeen.

Class VI.—*To the owner of the best Heifer, calved after the* 1*st of January*, 1861.

First prize of £8 to No. 563, The Earl of Southesk, of Kinnaird Castle, Brechin, Forfar.

Second prize of £4 to No. 562, Alew Paterson, of Mulben, Blackhillock, Morayshire.

Third prize of Silver Medal to No. 564, Allan Pollok, of Lismany, Ballinasloe, Galway.

POLLED (GALLOWAY).

Class I.—*To the owner of the best Bull, calved before the* 1*st of January*, 1860.

First prize of £20 to No. 566, James Beattie, of Newbie House, Annan, Dumfries.

Second prize of £10 to No. 565, Joseph Marsland, of Glenae, Dumfries.

Third prize of Silver Medal to No. 568, James Graham, of Meikle Culloch, Dalbeattie, Kirkcudbright.

Highly Commended.—No. 567, Patrick Dudgeon, of Cargin, Dumfries.

Class II.—*To the owner of the best Bull, calved after the* 1*st of January*, 1860.

No entry.

Class III.—*To the owner of the best Bull, calved after the* 1*st of January*, 1861.

First prize of £10 to No. 570, Alexander Jardine, of Applegirth, Lockerbie, Dumfries.

Second prize of £5 to No. 571, Patrick Dudgeon, of Cargin, Dumfries.

Third prize of Silver Medal.—No competition.

Class IV.—*To the owner of the best Cow of any age.*

First prize of £10 to No. 574, James Beattie, of Newbie House, Annan, Dumfries.

Second prize of £5 to No. 573, The Duke of Buccleugh and Queensberry, of Drumlanrig, Thornhill, Dumfries.

Third prize of Silver Medal to No. 572, The Duke of Buccleugh and Queensberry, of Drumlanrig, Thornhill, Dumfries.

CLASS V.—*To the owner of the best Heifer, calved after the* 1*st of January,* 1860.

First prize of £10 to No. 579, James Graham, of Meikle Culloch, Dalbeattie, Kirkcudbright.

Second prize of £5 to No. 576, The Duke of Buccleugh and Queensberry, of Drumlanrig, Thornhill, Dumfries.

Third prize of Silver Medal to No. 577, The Duke of Buccleugh and Queensberry, of Drumlanrig, Thornhill, Dumfries.

Highly Commended.—No. 685, The Duke of Buccleugh, and Queensberry, of Drumlanrig, Thornhill, Dumfries.

CLASS VI.—*To the owner of the best Heifer, calved after the* 1*st of January,* 1861.

First prize of £8 to No. 580, The Duke of Buccleugh and Queensberry, of Drumlanrig, Thornhill, Dumfries.

Second prize of £4 to No. 582, Samuel Thompson, Blaiket, Crocketford, Kirkcudbright.

Third prize of Silver Medal to No. 585, Patrick Dudgeon, of Cargin, Dumfries.

Highly Commended.—No. 584, Samuel Thomson, of Blaiket, Crocketford, Kirkcudbright.

HIGHLAND.

CLASS I.—*To the owner of the best Bull, calved before the* 1*st of January,* 1859.

First prize of £20, to No. 588, John Malcolm, of Poltalloch, Callton-Mor, Lochgilphead, Argyll.

Second prize of £10 to No. 586, Allan Pollok, of Ronachan, Clachan, Cantire, Argyll.

Third prize of Silver Medal to No. 587, D. Fletcher, of Glenards, Tovermory, Argyll, and Givon's Grove, Leatherhead, Surrey.

CLASS II.—*To the owner of the best Bull, calved after the* 1*st of January,* 1859.

First prize of £20 to No. 589, The Marquis of Breadalbane, of Taymouth Castle, Aberfeldy, Perth.

CLASS III.—*To the owner of the best Bull, calved after the* 1*st of January,* 1860.

First prize of £10 to No. 590, Robert Anderson, of Lochelhi Kildrummie, Nairn.

CLASS IV.—*To the owner of the best Cow, of any age.*

First prize of £10 to No. 595, John Malcolm, of Poltalloch, Calton-Mor, Lochgilphead, Argyll.

Second prize of £5 to No. 591, Allan Pollok, of Ronachan, Clachan, Cantire, Argyll.

Third prize of Silver Medal to No. 598, Peter Beattie, of Dannydeers, Insch, Aberdeen.

Highly Commended.—No. 592, Allan Pollok, of Ronachan, Clachan, Cantire, Argyll.

Class V.—*To the owner of the best Heifer, calved after the 1st of January* 1859.

First prize of £10 to No. 602, The Marquis of Breadalbane, of Taymouth Castle, Aberfeldy.

Second prize of £5 to No. 601, The Marquis of Breadalbane, of Taymouth Castle, Aberfeldy.

Third prize of Silver Medal to No. 599, Allan Pollok, of Ronachan, Clachan, Cantire, Argyll.

Class VI.—*To the owner of the best Heifer, calved after the 1st of January,* 1860.

First prize of £8 to No. 610, The Marquis of Breadalbane, of Taymouth Castle, Aberfeldy, Perth.

Second prize of £4 to No. 609, The Marquis of Breadalbane, of Taymouth Castle, Aberfeldy, Perth.

Third prize of Silver Medal to No. 608, John Malcolm, of Poltalloch, Callton-Mor, Lochgilphead, Argyll.

Highly Commended.—No. 607, John Malcolm, of Poltalloch, Callton-Mor, Lochgilphead, Argyll.

AYRSHIRE.

Class I.—*To the owner of the best Bull, calved before the 1st of January,* 1860.

First prize of £20 to No. 615, The Duke of Hamilton and Brandon, of Hamilton Palace, Lanark.

Second prize of £10 to No. 613, Walter Weir, of Barmulloch, Springburn, Lanark.

Third prize withheld.

Class II.—*To the owner of the best Bull, calved after the 1st of January,* 1860.

First prize of £20 to No. 621, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Second prize of £10 to No. 618, The Duke of Atholl, of Dunkeld, Perth.

Third prize of Silver Medal.—No competition.

Class III.—*To the owner of the best Bull, calved after the 1st of January,* 1861.

First prize of £10 to No. 622, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Second prize of £5 to No. 624, Alexander Oswald, of Auchincruive, Ayr.

Third prize of Silver Medal to No. 623, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Class IV.—*To the owner of the best Cow, in milk, of any age.*

First prize of £10 to No. 630, The Duke of Atholl, of Dunkeld, Perth.

Second prize of £5 to No. 634, The Duke of Hamilton and Brandon, of Hamilton Palace, Lanarkshire.

Third prize of Silver Medal to No. 633, Mrs. Wilson, of Forehouse, Kilbarcham, Renfrewshire.

Highly Commended.—No. 628, The Duke of Atholl, of Dunkeld, Perth.

Commended.—No. 635, The Duke of Hamilton and Brandon, of Hamilton Palace, Lanarkshire.

Class V.—*To the owner of the best Cow, in calf, of any age.*

First prize of £10 to No. 654, The Duke of Hamilton and Brandon, of Hamilton Palace, Lanark.

Second prize of £5 to No. 642, The Earl of Strathmore, of Glamis House, Glamis, Forfar.

Third prize of Silver Medal to No. 643, The Earl of Strathmore, of Glamis House, Glamis, Forfar.

Highly Commended.—No. 653, Mrs. Wilson, of Forehouse, Kilbarcham, Renfrew.

Commended.—No. 646, David Tweedie, of Castle Crawford, Abington, Lanark.

Class VI.—*To the owner of the best Heifer, calved after the* 1*st of January,* 1860.

First prize of £10 to No. 666, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Second prize of £5 to No. 664, Alexander Oswald, of Auchincruive, Ayr.

Third prize of Silver Medal to No. 665, Alexander Oswald, of Auchincruive, Ayr.

Highly Commended.—No. 662, David Tweedie, of Castle Crawford, Abington, Lanark.

Commended.—No. 667, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Class VII.—*To the owner of the best Heifer, calved after the* 1*st of January,* 1861.

First prize of £8 to No. 677, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Second prize of £4 to No. 679, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Third prize of Silver Medal to No. 678, John Stewart, of Burnside Cottage, Strathaven, Lanark.

Highly Commended.—No. 681, The Duke of Hamilton and Brandon, Hamilton Palace, Lanark.

Commended.—No. 675, The Earl of Strathmore, of Glamis House, Glamis, Forfar.

HORSES.

To the owner of the best Thorough-bred Stud Horse, having served Mares during the season 1862, *which, in the opinion of the Judges, is best calculated to improve and perpetuate the breed of the sound and stout Thorough-bred Horse for General Stud purposes.*

First prize of £100 to No. 692, Henry Richard Phillips, of Albert-gate, Knightsbridge, and Willesden Paddocks, Kilburn, Middlesex.

Second prize of £25 to No. 690, Charles Edwards Johnstone, of 105, Gloucester place, Portman square.

Highly Commended.—No. 684, Tom Hussey, of Stud Farm, Skirmett, Henley-on-Thames, Oxfordshire.

HUNTER.

Class I.—*To the owner of the best Stallion, thorough or half-bred.*

First prize of £30 to No. 703, John Manning, of Orlingbury, Wellingborough, Northamptonshire.

Second prize of £15 to No. 705, Rous John Cooper, of Blythburgh Lodge, near Halesworth, Suffolk.

Highly Commended.—No. 707, Robert Glasscock, of Great Saling, Braintree, Essex.

Class II.—*To the owner of the best Brood Mare, with foal at foot, or in foal.*

First prize of £20 to No. 746, A. Hawxwell, of Prospect House, Thirsk, Yorkshire.

Second prize of £10 to No. 708, Lord Berners, of Keythorp Hall, Leicester.

Class III.—*To the owner of the best Gelding, four or five years old.*

First prize of £20 to No. 727, Robert and John Russell, of Horton Kirby, Dartford, Kent.

Second prize of £10 to No. 731, John Henry Elwes, of 41, Portman Square, London, and Colesbourne, Cheltenham.

Class IV.—*To the owner of the best Mare, four or five years old.*

First prize of £20 to No. 734, John Robinson, of Hutton, Rudly-by-Yarm, Yorkshire.

CARRIAGE.

Class I.—*To the owner of the best Stallion.*

First prize of £20 to No. 737, George Holmes, of Newbegin, Beverley, York.

Second prize of £10 to No. 738, Joseph Kitchin, of Dunsdale, Westerham, Kent.

Class II.—*To the owner of the best Brood Mare, with foal at foot, or in-foal.*

First prize of £20 to No. 742, Rous John Cooper, of Blythburgh Lodge, near Halesworth, Suffolk.

Second prize of £10 to No. 744, George Holmes, of Newbegin, Beverley, York.

ROADSTER.

Class I.—*To the owner of the best Stallion.*

First prize of £20 to No. 758, William Johnson, of Billinghay, Sleaford, Lincoln.

Second prize of £10 to No. 756, Huntington Martin, of The Lawns, Downham, near Ely, Cambridgeshire.

Highly Commended.—No. 757, Dennis Topham Moss, of 16, Camden Terrace, Leeds, Yorkshire.

Class II.—*To the owner of the best Brood Mare, with foal at foot, or in-foal.*

First prize of £20 to No. 763, Jonathan Peel, of Knowlmere Manor, Clitheroe, Yorkshire.

Second prize of £10 to No. 764, Hugh Josceline Percy, of Eskrigg, Wigton, Cumberland.

AGRICULTURAL HORSES.

SUFFOLK.

Class I.—*To the owner of the best Stallion, foaled on or before the 1st of January,* 1860.

First prize of £30 to No. 768, Herman Biddell, of Playford, Ipswich, Suffolk.

Second prize of £15 to No. 773, Thomas Crisp, of Butley Abbey, Wickham Market.

Highly Commended.—No. 775, Thomas Crisp, of Butley Abbey, Wickham Market.

Commended.—No. 774, Thomas Crisp, of Butley Abbey, Wickham Market.

Class II.—*To the owner of the best Stallion, foaled in the year* 1860.

First prize of £20 to No. 789, Henry Giles, jun., of Bull Hill, Great Clacton, Colchester, Essex.

Second prize of £10 to No. 792, Thomas Crisp, of Butley Abbey, Wickham Market, Suffolk.

Highly Commended.—No. 791, William Stearn, of Elmset Hall, Hadleigh, Suffolk.

Commended.—No. 795, Maurice Mumford, of West Creeting, Needham Market, Suffolk; No. 797, William Wilson, of Baylham Hall, Ipswich, Suffolk.

Class III.—*To the owner of the best Mare and Foal.*

First prize of £20 to No. 805, William Thompson, jun., of Rose Cottage, Thorpe, Colchester, Essex.

Second prize of £10 to No. 802, Samuel Wolton, of Newbourn Hall, Woodbridge, Suffolk.

Highly Commended.—No. 813, Edward Gowing Hodgson, of Charsfield Hall, Wickham Market.

Commended.—No. 804, William Thompson, jun., of Rose Cottage, Thorpe, Colchester, Essex.

Class IV.—*To the owner of the best Two years old Filly.*

First prize of £15 to No. 818, George Tomline, M.P., of Nacton, Ipswich, Suffolk.

Second prize of £10 to No. 825, Nathaniel George Barthropp, of Creetingham Rookery, Wickham Market, Suffolk.

Highly Commended.—No. 814, Samuel Wolton, of Newbourn Hall, Woodbridge, Suffolk.

Commended.—No. 819, John Ward, of East Mersea, Colchester, Essex.

AGRICULTURAL

NOT QUALIFIED TO COMPETE AS SUFFOLK.

Class I.—*To the owner of the best Stallion, foaled on or before the* 1*st of January*, 1860.

First prize of £30 to No. 840, George Kempson, of Pegsdon Bottom Farm, Beds, near Hitchin, Herts.

Second prize of £15 to No. 844, Matthew Read, of Beamish Burn, Chester-le-Street, Durham.

Highly Commended.—No. 839, John Brown, of Compton, Newbury, Berks.

Commended.—No. 836, Edward Gibbs, of Chittern, Heytesbury, Wiltshire.

Class II.—*To the owner of the best Stallion, foaled in the year* 1860.

First prize of £20 to No. 850, David Begbie, of Morden, Mitcham, Surrey.

Second prize of £10 to No. 851, The Hon. Col. Pennant, M.P., of Penrhyn Castle, Bangor, Carnarvon.

Commended.—No. 849, James Oram, of Shellingford, Farringdon, Berkshire.

Class III.—*To the owner of the best Mare and Foal.*

First prize of £20 to No. 857, John Gay Attwater, of Hallingwood Farm, Cubberley, Cheltenham, Gloucester.

Second prize of £10 to No. 860, Edward Redding, of Compton Marsh, Farringdon, Berks.

Commended.—No. 861, Sir Robert George Throcmorton, Bart., of Buckland, Farringdon, Berks.

Class IV.—*To the owner of the best Two years old Filly.*

First prize of £15 to No. 867, Edward Phillimore, of 119, High Street, Cheltenham, Gloucestershire.

Second prize of £10 to No. 865, The Duke of Richmond, of Goodwood, Chichester, Sussex.

Commended.—No. 866, The Duke of Richmond, of Goodwood, Chichester Sussex.

DRAY.

Class I.—*To the owner of the best Stallion, foaled on or before the 1st of January,* 1860.

First prize of £30 to No. 874, John Foster, of Bingham, Nottingham.

Class II.—*To the owner of the best Stallion, foaled in the year* 1860.

First prize of £20 to No. 876, William Henry Neale, of Old Eclipse Inn, Mansfield, Nottinghamshire.

Class III.—*To the owner of the best Mare and Foal.*

First prize of £20 to No. 879, William Fullard, of Thorney, near Peterborough, Cambs.

Class IV.—*To the owner of the best Filly, foaled in the year* 1860.

First prize of £15 to No. 880, John K. Tombs, of Langford, Lechlade, Gloucester.

PONIES

ABOVE 12½ AND UNDER 14 HANDS.

Class I.—*To the owner of the best Stallion.*

First prize of £15 to No. 884, William Blenkiron, of Middle Park, Eltham, Kent.

Second prize of £5 to No. 883, Michael Sherring Ashwell, of Barrowby, Grantham, Lincolnshire.

Commended.—No. 886, John Beevor, M.D., of Mill Gate, Newark, Notts.; 889, John Massey, of Moston Hall, Chester, Cheshire.

Class II.—*To the owner of the best Mare.*

First prize of £10 to No. 894, Francis Cook Matthews, of Driffield, Yorkshire.

Second prize of £5 to No. 891, Frederick Branwhite, of Long Melford, Sudbury, Suffolk.

Class III.—*To the owner of the best Gelding, four or five years old.*

The prize of £10 to No. 901, Frederick Branwhite, of Long Melford, Sudbury, Suffolk.

PONIES

NOT EXCEEDING 12½ HANDS.

CLASS I.—*To the owner of the best Stallion.*

First prize of £15 to No. 913, Thomas Baker, of Lynton, Barnstaple, Devon.

CLASS II.—*To the owner of the best Mare.*

First prize of £10 to No. 923, William Henry Walker, of Wennington, Romford, Essex.

Second prize of £5 to No. 922, John Jefferies Stone, of Ashton Villa, Wickham Road, Upper Lewisham Road, Kent.

CLASS III.—*To the owner of the best Gelding, four or five years old.*

The prize of £10 to No. 939, Lord Braybrooke, of Heyden, Royston, Essex.

PRIZES

Given by the Highland and Agricultural Society of Scotland.

HORSES.

CLYDESDALE.

CLASS I.—*To the owner of the best Stallion, foaled before the 1st of January,* 1859.

First prize of £30 to No. 947, The Duke of Hamilton and Brandon, of Hamilton Palace, Lanark.

Second prize of £15 to No. 941, William Kerr, of Lochend, Kilburnie, Ayrshire.

Third prize of Silver Medal to No. 945, William Stirling, M.P., of Kerr, Dunblane.

Highly Commended.—No. 944, James M'Artney, of Muchhart, Perth.

CLASS II.—*To the owner of the best Entire Colt, foaled after the 1st of January,* 1859.

First prize of £20 to No. 952, Robert Mowbray, of Cambus, Clackmannan.

Second prize of £10 to No. 948, Daniel Logan, of Netherton, Renfrew.

Third prize of Silver Medal to No. 949, John Hendries, of Kirkwood, Coatbridge, Lanark.

Highly Commended.—No. 951, Robert Mowbray, of Cambus, Clackmannan.

CLASS III.—*To the owner of the best Mare (with foal at foot), foaled before the 1st of January,* 1859.

First prize of £20 to No. 955, John Kerr, of Morton, Mid Calder, Edinburgh.

Second prize of £10 to No. 954, James Gray, of Blawart Hill, Yoker, Renfrew.

Third prize of Silver Medal to No. 956, Col. Buchanan, of Drumpellier House, Coatbridge, Lanark.

CLASS IV.—*To the owner of the best Mare (in-foal), foaled before the 1st of January*, 1859.

First prize of £16 to No. 958, William Stirling, M.P., of Keir, Dunblane, Perth.

Second prize of £8 to No. 962, The Duke of Hamilton and Brandon, of Hamilton Palace, Lanark.

Third prize of Silver Medal to No. 961, William Stirling, M.P., of Keir, Dunblane, Perth.

Highly Commended.—No. 959, William Stirling, M.P., of Keir, Dunblane, Perth.

Commended.—No. 963, William Stirling, M.P., of Keir, Dunblane, Perth.

CLASS V.—*To the owner of the best Filly, foaled after the 1st of January*, 1859.

First prize of £10 to No. 965, Robert Findlay, of Easterhill, Glasgow.

Second prize of £5 to No. 964, Robert Findlay, of Easterhill, Glasgow.

Third prize of Silver Medal to No. 967, John Hendries, of Kirkwood, Coatbridge, Lanark.

Highly Commended.—No. 966, Allan Pollok, of Ronachan, Kyntire.

SHEEP.

LEICESTER.

CLASS I.—*To the owner of the best Shearling Ram.*

First prize of £20 to No. 980, William Sanday, of Holme Pierrepont, Notts.

Second prize of £10 to No. 976, Thomas Edward Pawlett, of Beeston, Sandy, Bedfordshire.

Third prize of £5 to No. 981, William Sanday, of Holme Pierrepont, Notts.

Highly Commended.—No. 975, Thomas Edward Pawlett, of Beeston, Sandy, Bedfordshire.

Commended.—No. 996, Robert Ward Cresswell, of Ravenstone, Ashby-de-la-Zouch.

CLASS II.—*To the owner of the best Ram of any other age.*

First prize of £20 to No. 1009, William Sanday, of Holme Pierrepont, Notts.

Second prize of £10 to No. 1012, William Sanday, of Holme Pierrepont, Notts.

Third prize of £5 to No. 1014, William Sanday, of Holme Pierrepont, Notts.

Highly Commended.—No. 1008, William Sanday, of Holme Pierrepont, Notts.

Commended.—No. 1010, William Sanday, of Holme Pierrepont, Notts; No. 1013, William Sanday, of Holme Pierrepont, Notts; No. 1024, Robert Ward Cresswell, of Ravenstone, Ashby-de-la-Zouch, Leicester.

CLASS III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £20 to No. 1036, William Sanday, of Holme Pierrepont, Notts.

Second prize of £10 to No. 1037, William Sanday, of Holme Pierrepont, Notts.

Third prize of £5 to No. 1040, William Lovel, of Nafferton Grange, Driffield, Yorkshire.

Commended.—No. 1038, Lieut.-Col. William Inge, of Thorpe Constantine, Tamworth, Staffordshire; No. 1034, John Gregory Watkins, of Woodfield, Ombersley, Droitwitch, Worcestershire; No. 1039, Francis Jordan, of Eastburn House, Great Driffield, Yorkshire.

To the owner of the best Ram in the Leicester Classes.

Gold Medal to No. 1009, William Sanday, of Holme Pierrepont, Notts.

LINCOLN.

Class I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1048, Thomas Bumpstead Marshall, of Branston, Lincolnshire.

Second prize of £10 to No. 1047, Thomas Bumpstead Marshall, of Branston, Lincolnshire.

Third prize of £5 to No. 1049, James Mayfield, of Billinghay Dales, Coningsby, Lincolnshire.

Class II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1057, Thomas Bumpstead Marshall, of Branston, Lincolnshire.

Second prize of £10 to No. 1053, John Clarke, of Old Bank House, Long Sutton, Lincolnshire.

Third prize of £5 to No. 1050, James Mayfield, of Billinghay Dales, Coningsby, Lincolnshire.

Class III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1059, William Greetham, of Stainfield, Wragby, Lincolnshire.

COTSWOLD.

Class I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1114, William Garne, of Kilkenny Farm, Bibury, Fairford, Gloucestershire.

Second prize of £10 to No. 1093, Edward Handy, of Sierford, Cheltenham, Gloucestershire.

Third prize of £5 to No. 1081, William Lane, of Broadfield Farm, Northleach, Gloucestershire.

Highly Commended.—No. 1112, William Garne, Kilkenny Farm, Bibury, Gloucestershire.

Commended.—No. 1078, William Lane, of Broadfield Farm, Northleach, Gloucestershire.

Class II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1128, William Lane, of Broadfield Farm, Northleach, Gloucestershire.

Second prize of £10 to No. 1129, William Lane, of Broadfield Farm, Northleach, Gloucestershire.

Third prize of £5 to No. 1131, Edward Handy, of Sierford, Cheltenham, Gloucestershire.

Highly Commended.—No. 1138, Robert Garne, of Aldsworth, Northleach, Gloucestershire.

Commended.—No. 1139, Robert Garne, of Aldsworth, Northleach, Gloucestershire.

Class III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1147, William Lane, of Broadfield Farm, Northleach, Gloucestershire.

Second prize of £10 to No. 1149, John King Tombs, of Langford, Lechlade, Gloucestershire.

Third prize of £5 to No. 1148, William Lane, of Broadfield Farm, Northleach, Gloucestershire.

Highly Commended.—No. 1150, John King Tombs, of Langford, Lechlade, Gloucestershire.

Commended.—No. 1146, William Lane, of Broadfield Farm, Northleach, Gloucestershire.

KENTISH OR ROMNEY MARSH.

Class I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1157, Frederick Murton, of Smeeth, Ashford, Kent.

Second prize of £10 to No. 1154, Thomas Blake, of Sycamore House, Dymchurch, Folkstone, Kent.

Third prize of £5 to No. 1151, George Jenner, of Parsonage House, Udimore, Rye, Sussex.

Class II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1161, Thomas Blake, of Sycamore House, Dymchurch, Folkstone, Kent.

Second prize of £10 to No. 1163, Thomas Blake, of Sycamore House, Dymchurch, Folkstone, Kent.

Third prize of £5 to No. 1164, Frederick Murton, of Smeeth, Ashford, Kent.

Class III.—*To the owner of the best Pen of Five Shearing Ewes, of the same flock.*

First prize of £15 to No, 1170, Frederick Murton, of Smeeth, Ashford, Kent.

Second prize of £10 to No. 1169, Frederick Murton, of Smeeth, Ashford, Kent.

Third prize of £5 to No. 1166, George Jenner, of Parsonage House, Udimore, Rye, Sussex.

LONG-WOOLLED

Not qualified to compete as Leicesters, Lincolns, Cotswolds, or Kentish.

Class I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1179, John Lynn, of Church Farm, Stroxton, Grantham, Lincoln.

Second prize of £10 to No. 1177, John Lynn, of Church Farm, Stroxton, Grantham, Lincoln.

Third prize of £5 to No. 1178, John Lynn, of Church Farm, Stroxton, Grantham, Lincoln.

Commended.—No. 1172, Hugh Aylmer, of West Dereham Abbey, Stoke Ferry, Norfolk; No. 1173, Hugh Aylmer, of West Dereham Abbey, Stoke Ferry, Norfolk; No. 1174, Hugh Aylmer, of West Dereham Abbey, Stoke Ferry, Norfolk.

CLASS II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1194, Joseph Simpson, of Spofforth Park, Wetherby, York.

Second prize of £10 to No. 1196, Joseph Simpson, of Spofforth Park, Wetherby, York.

Third prize of £5 to No. 1195, Joseph Simpson, of Spofforth Park. Wetherby, York.

Commended.—No. 1192, John Lynn, of Church Farm, Stroxton, Grantham, Lincoln; No. 1188, Hugh Aylmer, of West Dereham, Stoke Ferry, Norfolk; No. 1189, Hugh Aylmer, of West Dereham, Stoke Ferry, Norfolk; No. 1190, Hugh Aylmer, of West Dereham, Stoke Ferry, Norfolk.

CLASS III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1199, Hugh Aylmer, of West Dereham Abbey, Stoke Ferry, Norfolk.

Second prize of £10 to No. 1200, Joseph Simpson, of Spofforth Park, Wetherby, York.

Third prize of £5 to No. 1201, John King Tombs, of Langford, Lechlade, Gloucestershire.

IRISH—PURE NATIVE LONG-WOOLLED BREEDS.

CLASS I.—*To the owner of the best Shearling Ram.*

CLASS II.—*To the owner of the best Ram of any other age.*

CLASS III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

No entries.

SOUTHDOWN.

CLASS I.—*To the owner of the best Shearling Ram.*

First prize of £20 to No. 1227, The Earl of Radnor, of Coleshill House, Highworth, Wilts.

Second prize of £10 to No. 1209, William Rigden, of Hove, Brighton, Sussex.

Third prize of £5 to No. 1211, William Rigden, of Hove, Brighton, Sussex.

Highly Commended.—Nos. 1210, 1208, William Rigden, of Hove, Brighton, Sussex.

Commended.—No. 1248, The Duke of Beaufort, of Badminton, Chippenham, Wilts; No. 1252, John Overman, of Burnham Sutton, Burnham Market, Norfolk.

CLASS II.—*To the owner of the best Ram of any other age.*

First prize of £20 to No. 1261, William Rigden, of Hove, Brighton, Sussex.

Second prize of £10 to No. 1269, Lord Walsingham, of Merton Hall, Thetford, Norfolk.

Third prize of £5 to No. 1271, Lord Walsingham, of Merton Hall, Thetford, Norfolk.

Highly Commended.—No. 1272, Lord Walsingham, of Merton Hall, Thetford, Norfolk; No. 1276, John Waters, of Motcomb, Eastbourne, Sussex.

Commended.—No. 1258, The Duke of Richmond, of Goodwood, Chichester; No. 1273, Lord Walsingham, of Merton Hall, Thetford, Norfolk; No. 1275, John Waters, of Motcomb, Eastbourne, Sussex.

Class III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £20 to No. 1297, Sir Robert George Throckmorton, Bart., of Buckland, Farringdon, Berks.

Second prize of £10 to No. 1289 Lord Walsingham, of Merton Hall, Thetford, Norfolk.

Third prize of £5 to No. 1287, The Earl of Radnor, of Coleshill House, Highworth, Wilts.

Highly Commended.—No. 1290, Lord Walsingham, of Merton Hall, Thetford, Norfolk; No. 1283, William Rigden, of Hove, Brighton, Sussex.

Commended.—Nos. 1280, 1281, The Duke of Richmond, of Goodwood, Chichester; No. 1296, Sir Thomas Barrett Lennard, Bart., of Belhus Aveley, Romford, Essex.

To the owner of the best Ram in the Southdown Classes.

Gold Medal to No. 1261, William Rigden, of Hove, Brighton, Sussex.

SHROPSHIRE.

Class I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1302, Thomas Horton, of Harnage Grange, Shrewsbury, Salop.

Second prize of £10 to No. 1349, Thomas Mansell, of Adcott Hall, Shrewsbury, Salop.

Third prize of £5 to No. 1351, Henry Matthews, of Montford, Shrewsbury, Salop.

Highly Commended.—No. 1325, Thomas Horley, jun., of The Fosse, near Leamington, Warwickshire.

Commended.—No. 1314, Samson Byrd, of The Leese Farm, Stafford. No. 1331, James and Edward Crane, of Shrawardine, Shrewsbury, Salop. No. 1337, John Evans, of Uffington, Shrewsbury. No. 1338, John Evans, of Uffington, Shrewsbury, Salop. No. 1350, Henry Matthews, of Montford, Shrewsbury, Salop. No. 1353, Augustus H. Minor, of Astley House, Shrewsbury, Salop.

Class II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1370, Thomas Horley, jun., of The Fosse, near Leamington, Warwick.

Second prize of £10 to No. 1372, Price William Bowen, of Shrawardine Castle, Shrewsbury.

Third prize of £5 to No. 1360, Thomas Horton, of Harnage Grange, Shrewsbury, Salop.

Very Highly Commended.—No. 1383, Lord Wenlock, of Bourton Cottage, Much Wenlock, Salop.

Highly Commended.—No. 1377, William Orme Foster, of Kinver Hill Farm, Stourbridge, Worcester. No. 1378, William Orme Foster, of Kinver Hill Farm. No. 1381, William Goodwin Preece, of Shrewsbury, Salop.

Class generally Commended.

Class III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1388, James and Edward Crane, of Shrawardine, Shrewsbury, Salop.

Second prize of £10 to No. 1389, James and Edward Crane, of Shrawardine, Shrewsbury, Salop.

Third prize of £5 to No. 1891. Henry Matthews, of Montford, Shrewsbury.

Highly Commended.—No. 1387, Thomas Horley, jun., of The Fosse, near Leamington, Warwickshire.

HAMPSHIRE AND WEST-COUNTRY DOWN.

CLASS I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1395, Stephen King, of Old Hayward Farm, Hungerford, Berks.

Second prize of £10 to No. 1396, Stephen King, of Old Hayward Farm, Hungerford, Berks.

Third prize of £5 to No. 1417, John Reeks Neate, of Northington Farm, Overton, Hants.

CLASS II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1426, William Humfrey, of Oak Ash, Chaddleworth, Wantage, Berks.

Second prize of £10 to No. 1425, William Humfrey, of Oak Ash, Chaddleworth, Wantage, Berks.

Third prize of £5 to No. 1421, Stephen King, of Old Hayward Farm, Hungerford, Berks.

Highly Commended.—No. 1420, William Rowden Shittler, of Bishopston, Salisbury, Wilts; No. 1422, William Browne Canning, of Chisledon, Swindon, Wilts.

CLASS III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1438, William Humfrey, of Oak Ash, Chaddleworth, Wantage, Berks.

Second prize of £10 to No. 1428, William Rowden Shittler, of Bishopston, Salisbury, Wilts.

Third prize of £5 to No. 1431, William Francis Bennett, of Chilmark, Salisbury, Wilts.

Highly Commended.—No. 1435, William Browne Canning, of Chisledon, Swindon, Wilts.

Class generally Commended.

OXFORDSHIRE DOWN.

CLASS I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1473, Charles Gillett, of Cote House, Bampton, Farringdon, Berks.

Second prize of £10 to No. 1472, Charles Gillett, of Cote House, Bampton, Farringdon, Berks.

Third prize of £5 to No. 1470, Charles Gillett, of Cote House, Bampton, Farringdon, Berks.

CLASS II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1489, Charles Gillett, of Cote House, Bampton, Farringdon, Berks.

Second prize of £10 to No. 1483, The Executors of the late Samuel Treadwell, of Upper Winchendon, Waddesdon, near Aylesbury, Bucks.

Third prize of £5 to No. 1492, Henry Barnett, of Glympton Park, Woodstock, Oxon.

CLASS III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1499, Charles Gillett, of Cote House, Bampton, Farringdon, Berks.

Second prize of £10 to No. 1498, The Duke of Marlborough, of Blenheim, Wookstock, Oxon.

Third prize of £5 to No. 1494, Charles Howard, of Biddenham, Beds.

DORSET.

Class I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1501, Thomas Danger, of Huntstile, Bridgewater, Somerset.

Second prize of £10 to No. 1502, Thomas Danger, of Huntstile, Bridgewater, Somerset.

Third prize of £5 to No. 1505, Frederick Bond, of Whitelackinton, Ilminster, Somerset.

Commended.—No. 1503, William Paull, of Piddletown, Dorchester, Dorset.

Class II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1506, Thomas Danger, of Huntstile, Bridgewater, Somerset.

Second prize of £10 to No. 1507, Thomas Danger, of Huntstile, Bridgewater, Somerset.

Third prize of £5 to No. 1510, William Paull, of Piddletown, Dorchester.

Commended.—No. 1508, William Paull, of Piddletown, Dorchester.

Class III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1512, Thomas Danger, of Huntstile, Bridgewater, Somerset.

Second prize of £10 to No. 1511, Thomas Danger, of Huntstile, Bridgewater, Somerset.

Third prize of £5 to No. 1513, Frederick Bond, of Whitelackington, Ilminster, Somerset.

MOUNTAIN.

Class I.—*To the owner of the best Shearling Ram.*

First prize of £15 to No. 1518, Richard Eastwood, of Swinshawe House, Burnley, Lancaster.

Second prize of £10 to No. 1517, Richard Eastwood, of Swinshawe House, Burnley, Lancaster.

Third prize of £5 to No. 1514, James Merson, of Brinsworthy, North Molton, Devon.

Class II.—*To the owner of the best Ram of any other age.*

First prize of £15 to No. 1528, Jonathan Peel, of Knowlmere Manor, Clitheroe, Yorkshire.

Second prize of £10 to No. 1529, Jonathan Peel, of Knowlmere Manor, Clitheroe, Yorkshire.

Third prize of £5 to No. 1532, James Quartly, of Molland House, South Molton, Devon.

Commended.—No. 1526, James Merson, of Brinsworthy, North Molton, Devon.

Class III.—*To the owner of the best Pen of Five Shearling Ewes, of the same flock.*

First prize of £15 to No. 1536, Jonathan Peel, of Knowlmere Manor, Clitheroe, Yorkshire.

Second prize of £10 to No. 1539, The Honourable Colonel Pennant, M.P., of Penrhyn Castle, Bangor, Carnarvon.

Third prize of £5 to No. 1542, James Quartly, of Molland House, South Molton, Devon.

Highly Commended.—No. 1537, Richard Eastwood, of Swinshawe House, Burnley, Lancaster.

Commended.—No. 1538, Richard Eastwood, of Swinshawe House, Burnley, Lancaster.

PRIZES

Given by the Highland and Agricultural Society of Scotland.

SHEEP.

BLACKFACED.

Class I.—*To the owner of the best Tup, not more than 4-shear.*

First prize of £10 to No. 1554, Gavin Sandilands, of North Cumberhead, Lesmahagen, Lanark.

Second prize of £5 to No. 1558, James Drife, of Barr, Sanquhar, Dumfries.

Third prize of Silver Medal to No. 1546, Robert Elliott, of Laighwood, Dunkeld, Perthshire.

Highly Commended.—No. 1559, James Drife, of Barr, Sanquhar, Dumfries.

Class II.—*To the owner of the best Shearling Tup.*

First prize of £10 to No. 1570, James Drife, of Barr, Sanquhar, Dumfries.

Second prize of £5 to No. 1569, James Drife, of Barr, Sanquhar, Dumfries.

Third prize of Silver Medal to No. 1566, John Malcolm, of Poltalloch, Calton Mor, Lochgilphead, Argyll.

Highly Commended.—No. 1571, James Drife, of Barr, Sanquhar, Dumfries.

Class III.—*To the owner of the best Five Ewes, not more than 4-shear.*

First prize of £8 to No. 1575, Allan Pollok, of Ronachan, Clachan, Cantire, Argyll.

Second prize of £4 to No. 1576, James Drife, of Barr, Sanquhar, Dumfriesshire.

Third prize of Silver Medal to No. 1577, Samuel Newall, of Eastby, Skipton, Yorkshire.

Class IV.—*To the owner of the best Five Shearling Ewes.*

First prize of £8 to No. 1585, James Drife, of Barr, Sanquhar, Dumfriesshire.

Second prize of £4 to No. 1578, Alexander Campbell, Auchindarrach, Lochgilphead, Argyll.

Third prize of Silver Medal to No. 1584, Gavin Sandilands, of North Cumberhead, Lesmahagen, Lanark.

Highly Commended.—No. 1580, Robert Elliott, of Laighwood, Dunkeld, Perthshire.

CHEVIOT.

Class I.—*To the owner of the best Tup, not more than 4-shear.*

First prize of £10 to No. 1590, Thomas Brydon, of Kinnethead, Moffat, Dumfriesshire.

Second prize of £5 to No. 1591, James Brydon, of Moodlaw, Langholme, Dumfries.

Third prize of Silver Medal to No. 1594, Thomas Chalmers Borthwick, of Hopsrig, Langholme, Dumfries.

Highly Commended.—No. 1593, Thomas Chalmers Borthwick, of Hopsrig, Langholme, Dumfries.

Class II.—*To the owner of the best Shearling Tup.*

First prize of £10 to No. 1601, William Graham Hunter, of Dumfedling, Langholme, Dumfriesshire.

Second prize of £5 to No. 1598, Robert Borland, of Auchincairn, Closeburn, Thornhill, Dumfries.

Third prize of Silver Medal to No. 1599, William Graham Hunter, of Dumfedling, Langholme, Dumfriesshire.

Highly Commended.—No. 1597, Robert Borland, of Auchincairn, Closeburn, Thornhill, Dumfries.

Class III.—*To the owner of the best Five Ewes, not more than 4-shear.*

First prize of £8 to No. 1602, Thomas Chalmers Borthwick, of Hopsrig, Langholme, Dumfries,

Second prize of £4 to No. 1603, The Hon. Col. Pennant, M.P., of Penrhyn Castle, Bangor, Carnarvon.

Class IV.—*To the owner of the best Five Shearling Ewes.*

First prize of £8 to No. 1604, Robert Borland, of Auchincairn, Closeburn, Thornhill, Dumfries.

Second prize of £4 to No. 1606, Thomas Chalmers Borthwick, of Hopsrig, Langholme, Dumfries.

Third prize of Silver Medal to No. 1605, Sir Graham Graham Montgomery, Bart., M.P., of Stobo Castle, Peebles.

Highly Commended.—No. 1607, Thomas Chalmers Borthwick, of Hopsrig, Langholme, Dumfries.

PIGS.

Class I.—*To the owner of the best Boar of a large breed, of any colour.*

First prize of £10 to No. 1612, John Dyson, of Adelphi Hotel, Duck Street, Leeds, York.

Second prize of £5 to No. 1614, John Hickman, of West Parade, Spring Bank, Hull.

Highly Commended.—No. 1611, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire.

Class II.—*To the owner of the best Boar of a small white breed.*

First prize of £10 to No. 1632, Michael Gavins, of the Fox Inn, Woodhouse Carr, Leeds.

Second prize of £5 to No. 1617, George Mangles, of Givendale, Ripon, Yorkshire.

Highly Commended.—No. 1618, George Mangles, of Givendale, Ripon, Yorkshire.

Class generally highly Commended.

Class III.—*To the owner of the best Boar of a small black breed.*

First prize of £10 to No. 1650, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk.

Second prize of £5 to No. 1642, Thomas Crisp, of Butley Abbey, Wickham Market, Suffolk.

Highly Commended.—No. 1646, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk. No. 1644, Thomas Crisp, of Butley Abbey, Wickham Market, Suffolk.

Commended.—No. 1647, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk. No. 1648, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk.

Class IV.—*To the owner of the best Boar of the Berkshire breed.*

First prize of £10 to No. 1666, Sir Robert George Throckmorton, Bart., of Buckland, Farringdon, Berks.

Second prize of £5 to No. 1664, William Hewer, of Sevenhampton, Highworth, Wilts.

Highly Commended.—No. 1661, Rev. Henry G. Bailey, of Swindon, Wilts.

Class V.—*To the owner of the best Boar of a breed not eligible for the preceding classes.*

First prize of £10 to No. 1675, John Parkinson, of Girlington Cottage, Bradford, Yorkshire.

Second prize of £5 to No. 1670, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire.

Highly Commended.—No. 1677, George Chapman, of Seamer, Scarborough, York.

Class VI.—*To the owner of the best Breeding Sow of a large breed, of any colour.*

First prize of £10 to No. 1681, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire.

Second prize of £5 to No. 1694, Edward Harrison, of Woodhouse Moor, Leeds, Yorkshire.

Class VII.—*To the owner of the best Breeding Sow of a small white breed.*

First prize of £10 to No. 1702, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire.

Second prize of £5 to No. 1710, Samuel Geater Stearn, of Brandeston, Wickham Market, Suffolk.

Highly Commended.—No. 1703, William Bradley Wainman, of Carhead, Cross Hills, Leeds. No. 1709, Samuel Geater Stearn, of Brandeston, Wickham Market, Suffolk. No. 1716, William Hainworth, of Hitchin, Herts. No. 1719, George Edward Taylor, of Oatlands, Leeds. No. 1721, Samuel Geater Stearn, of Brandeston, Wickham Market, Suffolk. No. 1720, George Edward Taylor, of Oatlands, Leeds.

Commended.—No. 1697, George Mangles, of Givendale, Ripon, Yorkshire. No. 1714, Lord Wenlock, of Esrick Park, York.

Class generally recommended as excellent.

Class VIII.—*To the owner of the best Breeding Sow of a small black breed.*

First prize of £10 to No. 1740, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk.

Second prize of £5 to No. 1734, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk.

Highly Commended.—No. 1741, Samuel Wolton, of Kesgrave, Woodbridge, Suffolk. No. 1737, George Mumford Sexton, of Wherstead Hall, Ipswich.

Class generally Commended.

Class IX.—*To the owner of the best Breeding Sow of the Berkshire breed.*

First prize of £10 to No. 1756, Sir R. G. Throckmorton, Bart., of Buckland, Farringdon, Berks.

Second prize of £5 to No. 1749, William James Sadler, of Bentham Calcutt, Cricklade, Wilts.

Highly Commended.—No. 1746, Royal Agricultural College, Cirencester, Gloucester.

Commended.—No. 1750, John King Tombs, of Langford, Lechdale, Gloucester.

Class X.—*To the owner of the best Breeding Sow, of a breed not eligible for the preceding classes.*

First prize of £10 to No. 1764, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire.

Second prize of £5 to No. 1763, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire.

Highly Commended.—No. 1765, the Rev. Edward Elmhirst, of Shawell Rectory, Leicestershire; No. 1766, the Rev. Edward Elmhirst, of Shawell Rectory, Leicestershire; No. 1777, Joseph Foster, of Crownest, near Bingley, Yorkshire; and No. 1768, William Eardley, of Larkton Hall, Malpas, Chester.

Class XI.—*To the owner of the best Pen of three Breeding Sow Pigs of a large breed, of any colour, of the same litter, above four and under eight months old.*

First prize of £10 to No. 1779, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire.

Second prize of £5 to No. 1780, John Hickman, of West Parade, Spring Bank, Hull.

Class XII.—*To the owner of the best Pen of three Breeding Sow Pigs of a small white breed, of the same litter, above four and under eight months old.*

First prize of £10 to No. 1786, Lord Wenlock, of Esrick Park, Yorkshire.

Second prize of £5 to No. 1785, Lord Wenlock, of Esrick Park, Yorkshire.

Highly Commended.—No. 1783, William Bradley Wainman, of Carhead, Cross Hills, Yorkshire; and No. 1781, the Hon. Colonel Hood, of Cumberland Lodge, Windsor Park.

Class generally Commended.

Class XIII.—*To the owner of the best Pen of three Breeding Sow Pigs of a small black breed, of the same litter, above four and under eight months old.*

First prize of £10 to No. 1789, George Mumford Sexton, of Wherstead Hall, Ipswich.

Second prize of £5 to No. 1790, Samuel Wolton, of Kesgrave, Woodbridge, Suffolk.

Class XIV.—*To the owner of the best Pen of three Breeding Sow Pigs of the Berkshire breed, of the same litter, above four and under eight months old.*

First prize of £10 to No. 1795, The Rev. Henry G. Baily, of Swindon, Wilts.

Second prize of £5 to No. 1793, Joseph Druce, of Eynsham, Oxon.

Highly Commended.—No. 1796, William Hewer, of Sevenhampton, Highworth, Wilts.

Class XV.—*To the owner of the best Pen of three Breeding Sow Pigs of a breed not eligible for the preceding classes, of the same litter, above four and under eight months old.*

First prize of £10 to No. 1800, W. B. Wainman, of Carhead, Cross Hills, Yorkshire.

Second prize of £5 to No. 1799, Joseph Gledhill, of High Street, Heckmondwike, York.

Highly Commended.—No. 1803, George Chapman of Seamer, Scarborough, Yorkshire.

FOREIGN CATTLE.

CHAROLAISE.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to 1804, Comte Charles de Bouillé, à Villars, Département de la Nièvre, France.

Class II.—*To the owner of the best Female.*

First prize, a Gold Medal to No. 1805, Comte Charles de Bouillé, à Villars, Département de la Nièvre, France.

Grand Gold Medal of Honour to Nos. 1804 and 1805, Comte Charles de Bouillé, à Villars, Département de la Nièvre, France.

GARONNAISE.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1806, Henry Joseph Eluard, à Vert, St. Denis, de Seine-et-Marne.

Class II.—*To the owner of the best Female.*

No Entry.

NORMAN.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1808, Giot (Parfait, ainé), Chevry, Cossigny, Seine-et-Marne.

Class II.—*To the owner of the best Female.*

First prize, a Gold Medal to No. 1813, Giot (Parfait, ainé), Chevry, Cossigny.

Second prize, a Silver Medal to 1811, Henry Joseph Eluard, à Vert, St. Denis, Seine-et-Marne.

Third prize, a Bronze Medal to No. 1807, Henry Joseph Eluard, à Vert, St. Denis, de Seine-et-Marne.

Third prize, a Bronze Medal to No. 1812, Giot (Parfait, ainé), Chevry, Cossigny, Seine-et-Marne.

DE SALERS.

No Entry.

PYRENEAN.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1815, Henry Joseph Eluard, à Vert, St. Denis, Seine-et-Marne, Bernese Race Pyrenean.

Third prize, a Bronze Medal to No. 1814, Henry Joseph Eluard, à Vert, St. Denis, Seine-et-Marne.

Class II.—*To the owner of the best Female.*

No Entry.

BRETON.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1821, Samuel Camfield Baker, Beaufort Street, King's Road, Chelsea, Middlesex.

Second prize, a Silver Medal to No. 1820, Giot (Parfait, ainé), Chevry, Cossigny, Seine-et-Marne.

Third prize, a Bronze Medal to No. 1816, S. A. Madame la Princesse Baciocchi, of Korn-er-houét, Morbihan, France.

Highly Commended.—No. 1822, Sir Anthony de Rothschild, Bart., Aston Clinton, Tring, Bucks.

Class II.—*To the owner of the best Female.*

First prize, a Gold Medal to No. 1838, Giot (Parfait, ainé), Chevry, Cossigny, Seine-et-Marne.

Second prize, a Silver Medal to No. 1829, S. A. Madame la Princesse Baciocchi, Korn-et-houét, par Vannes, Morbihan.

Third prize, a Bronze Medal to No. 1837, Henry Joseph Eluard, Vert, St. Denis, Seine-et-Marne.

Highly Commended.—No. 1830, S. A. Madame la Princesse Baciocchi, Korn-er-houét, Morbihan.

OTHER FRENCH BREEDS.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1851, Giot (Parfait, ainé), Chevry, Cossigny, Seine-et-Marne.

Class II.—*To the owner of the best Female.*

First prize, a Gold Medal to No. 1852, Giot (Parfait, ainé), Chevry, Cossigny, Seine-et-Marne.

FLEMISH.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1854, Henri Mahieu, Tappelle les Dunkerque (Nord), France.

Class II.—*To the owner of the best Female.*

Medal to No. 1855, Henri Mahieu, Tappelle les Dunkerque (Nord), France.

DUTCH.

Class I.—*To the owner of the best Male.*

No Entry.

Class II.—*To the owner of the best Female.*

First prize, a Gold Medal to No. 1856, Giot, (Parfait, ainé), Chevry, Cossigny, Seine-et-Marne.

Second prize, a Silver Medal to No. 1860, Aarnoud Hendrik van Wickevoort, Crommelin, Berkenrode, near Haarlem, Holland.

SWISS BROWN.

Class I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1873, Forstand des Schweizerischen, Bawernvereins, Schwyz.

Second prize, a Silver Medal to No. 1871, Brethern Schneider, St. Urbanhof, Gemeinde Sursee, Canton Luzern.

Third prize, a Bronze Medal to No. 1862, Heinrich Dolder, Feld Meilen, near Zurich.

CLASS II.—*To the owner of the best Female.*

First prize, a Gold Medal to No. 1896, Franz Carl Mettler, Goldau, Canton Schwyz.

Second prize, a Silver Medal to No. 1901, Heinrich Schmid, Gattikon, Gemeinde, Thalweil, Canton of Zurich, Switzerland.

Third prize, a Bronze Medal to No. 1905, President of the Swiss Agricultural Society, Schwyz.

Highly Commended.—No. 1883, Clemenz Henggeler, Unter Egeri, Canton Zug. No. 1908, President of the Swiss Agricultural Society, Schwyz.

SWISS COLOURED.

CLASS I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1868, Landwirthschaftliche Gesellsechaft v. Simmenthal and Saanen (J. G. Karlen), Grossrath in Erlenbach, near Thun, Switzerland.

Second prize, a Silver Medal to No. 1865, Burry (Jean), Lussorf, Commune de Guin, Canton of Fribourg.

Third prize, a Bronze Medal to No. 1864, Adrien Ecoffey, Villars Sousmont, Canton of Fribourg.

CLASS II.—*To the owner of the best Female.*

First prize, a Gold Medal to No. 1876, Adrien Ecoffey, Villars Sousmont, Canton of Fribourg, Switzerland.

Second prize, a Silver Medal to No. 1894, Jean Fernand de Loyjs, de Treytorrens, Dorigny, près Lausanne, Canton de Vaud, Switzerland.

Third prize, a Bronze Medal to No. 1895, Jean Fernand de Loyjs, de Treytorrens, Dorigny, près Lausanne, Canton de Vaud, Switzerland.

Highly Commended.—No. 1875, Adrien Ecoffey, Villars Sousmont, Canton of Fribourg, Switzerland. No. 1884, Landwirthschaftliche Gesellsechaft v. Simmenthal and Saanan (J. G. Karlen), Grossrath in Erlenbach, near Thun, Switzerland.

SPANISH.

No Entries.

OTHER FOREIGN BREEDS.

No Entries.

INDIAN OR OTHER NATIVE COLONIAL BREEDS.

No Entries.

HORSES.

HORSES FOR HEAVY DRAUGHT, OF ANY PURE FOREIGN BREED.

No Entry.

AGRICULTURAL HORSES, USED FOR AGRICULTURAL PURPOSES GENERALLY.

CLASS I.—*To the owner of the best Male.*

First prize, a Gold Medal to No. 1912, Desvaux Roze (agriculturist), at Courville, department of Eure and Loir.

Class II.—*To the owner of the best Female.*

No Entry.

SHEEP.

FRENCH MERINO.

Class I.—*To the owner of the best Ram of any age.*

First prize, a Gold Medal to No. 1923, Charles Lefebvre, of St. Escobille, departement de Seine et Oise.

Second prize, a Silver Medal to No. 1914, German Victor Garnod, of Genouilly, Crisenoy, departement de Seine et Marne.

Third prize, a Bronze Medal to No. 1927, Auguste Charles Louis Noblet, Château-Renard, arrondissement de Montargis, departement du Loiret.

Highly Commended.—No. 1928, Auguste Charles Louis Noblet, Château-Renard, arrondissement de Montargis, departement du Loiret; and No. 1920, René Bailleau, of Illiers, departement d'Eure et Loir.

Commended.—No. 1916, Germain Victor Garnod, of Genouilly, Crisenoy, departement de Seine et Marne.

Grand Gold Medal of Honour to No. 1923, Charles Lefebvre, of St. Escobille, departement de Seine et Oise.

Class II.—*To the owner of the best Pen of Three Females.*

First prize, a Gold Medal to No. 1933, Arsene Gatineau, Farm of Beau Français, Canton of Iliers, department of Eure et Loir.

Second prize, a Silver Medal to No. 1936, Germain Victor Garnod, of Genouilly, Crisenoy, department of Seine et Marne.

Third prize, a Bronze Medal to No. 1930, Marin René Bailleau, Illiers, department of Eure et Loir.

Highly Commended.—No. 1935, Germain Victor Garnod, of Genouilly, Crisenoy, department of Seine et Marne.

SPANISH MERINO.

Class I.—*To the owner of the best Ram of any age.*

First prize, a Gold Medal to No. 1941, Christian Carl Suntheim, of Niedergandern, near Gottingen, in Hanover.

Second prize, a Silver Medal to No. 1940, Christian Carl Suntheim, of Niedergandern, near Gottingen, in Hanover.

Third prize, a Bronze Medal to No. 1942, Christian Carl Suntheim, of Neidergandern, near Gottingen, in Hanover.

Class II.—*To the owner of the best Pen of Three Females.*

First prize, a Gold Medal to No. 1945, Frederick Homeyer, Ranzin, near Mokow, Pomerania.

Second prize, a Silver Medal to No. 1946, Frederick Homeyer, Ranzin, near Mokow, Pomerania.

Third prize, a Bronze Medal to No. 1943, Christian Carl Suntheim, of Niedergandern, near Gottingen, in Hanover.

SAXON MERINO.

Class I.—*To the owner of the best Ram of any age.*

First prize, a Gold Medal to No. 1947, Carl August Gädegast, Thal, near Oschatz, Saxony.

Second prize, a Silver Medal to No. 1953, Heinrich Adolph Steiger, Leutewitz and Lothayn, near Meissen.

Third prize, a Bronze Medal, withheld.

Grand Gold Medal of Honour to No. 1947, Carl August Gädegast, Thal, near Oschatz, Saxony.

CLASS II.—*To the owner of the best Pen of Three Females.*

First prize, a Gold Medal to No. 1957, Heinrich Adolph Steiger, Leutewitz and Lothayn, near Meissen.

Second prize, a Silver Medal to No. 1955, Carl August Gädegast, Thal, near Oschatz, Saxony.

Third prize, a Bronze Medal, withheld.

OTHER PURE MERINO.

(*Not mentioned in the above Classes.*)

CLASS I.—*To the owner of the best Ram of any age.*

Prize withheld.

CLASS II.—*To the owner of the best Pen of Three Females.*

No Entry.

LONG-WOOLLED FOREIGN BREEDS.

CLASS I.—*To the owner of the best Ram of any age.*

First prize, a Gold Medal to No. 1960, Giot (Parfait, ainé,) Chevry, Cossigny, Seine et Marne, Soyeuse de Mauchamp.

CLASS II.—*To the owner of the best Pen of Three Females.*

No Entry.

SHORT-WOOLED FOREIGN BREEDS.

(*Not qualified for the above Classes.*)

CLASS I.—*To the owner of the best Ram of any age.*

Third prize, a Bronze Medal to No. 1963, Acclimatisation Society, 3, Duke Street, Adelphi, W.C.

CLASS II.—*To the owner of the best Pen of Three Females.*

Third prize, a Bronze Medal to No. 1965, Acclimatisation Society, 3, Duke-street, Adelphy, W.C.

CROSS-BRED MERINO.

CLASS I.—*To the owner of the best Ram of any age.*

First prize, a Gold Medal to No. 1971, Giot (Parfait, ainé), Chevry, Cossigny, Seine et Marne.

Second prize, a Silver Medal to No. 1978, Pierre Nicolas Godin, ainé, Chatillon-sur-Seine (Côte d'Or).

Third prize, a Bronze Medal to No. 1970, Giot (Parfait, ainé), Chevry, Cossigny, Seine et Marne.

CLASS II.—*To the owner of the best Pen of Three Females.*

First prize, a Gold Medal to No. 1983, Pierre Nicolas Godin, ainé, Chatillon-sur-Seine (Côte d'Or).

Second prize, a Silver Medal to No. 1980, Pierre Nicolas Godin, ainé, Chatillon-sur-Seine (Côte d'Or).

Third prize, a Bronze Medal to No. 1982, Pierre Nicolas Godin, ainé, Chatillon-sur-Seine (Côte d'Or).

OTHER MIXED BREEDS.

Class I.—*To the owner of the best Ram of any age.*

Prize withheld.

Class II.—*To the owner of the best Pen of Three Females.*

Prize withheld.

PIGS.

PURE FOREIGN BREEDS.

Class I.—*To the owner of the best Male.*

Second prize, a Silver Medal to No. 1986, Henry Joseph Eluard, Vert St. Denis, near Cesson, Seine-et-Marne.

Class II.—*To the owner of the best Female.*

No Entry.

THE COLEMAN PRIZE.

The Governors of the Royal Veterinary College having determined this year to test the competitors for the "Coleman Prize" by a written examination, the following questions were drawn up for the purpose.

1. Describe the pathology of navicular disease, in its various recognised stages.

2. Describe the pathology of the disease termed broken wind.

3. Describe the membranes of the brain and spinal cord; and be particular in pointing out the peculiarities of each.

4. Describe the anatomy and physiology of the diâphragm and intercostal muscles.

5. Describe the natural history of the hydatid met with in the brain of the sheep; the symptoms of its presence, and the means of affording relief to the animal.

6. Describe the nature, causes, symptoms, and treatment of parturient apoplexy of the cow.

7. Give the composition and scientific names; and describe the preparation, properties, and uses of, corrosive sublimate, calomel, and white precipitate.

8. Name the elements composing albumen, fibrin, and casein; enumerate the principal gases which are evolved when these three substances putrefy; and state by what physical characters and chemical tests you could distinguish the above-named proximate principles from each other.

The competition was a very spirited one, and resulted in the following award, which was made by the Governors at their quarterly meeting a few days since.

1st, Silver Medal.—Mr. Alexander Loonie Gibson, Manchester.

Motto.—*Nil desperandum.*

2nd, Bronze Medal.—Mr. Richard Samuel Reynolds, Princes Risborough, Bucks.

Motto.—*Spes.*

3rd Certificate of Merit.

Mr. Thos. Burrell, London.

Motto.—*Uter Nostrum.*

Mr. Wm. Carless, Stafford.

Motto.—*Elcho.*

} Equal.

The medals bear on the obverse a well executed likeness of the late Professor Coleman, and on the "reverse, awarded to Mr. —— for distinguished attainments."

The certificates, beautifully engrossed on vellum, are also appropriately worded.

Extracts from British and Foreign Journals.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

SPLENIC APOPLEXY IN CATTLE AND SHEEP.

A WEEKLY meeting of the council and members of the Society—the last of the present season for discussion on special subjects connected with agriculture—took place on Wednesday, July 9th, in Hanover Square. The chair was taken at noon by the Earl of Powis.

After some routine business,

Professor SIMONDS rose, in pursuance of notice, to introduce the above subject. He said the remarks he was about to make with regard to the nature and probable causes of splenic apoplexy—a disease, the name of which he would explain presently—were to be considered as simply preparatory to the reading of some reports in relation to an outbreak of this disease in Somersetshire. The attention of the council was first called to the matter about six months since by Sir William Miles; and, as the veterinary officer of the society, he received instructions to investigate the facts of the outbreak. On his return from the neighbourhood he prepared his report, having ascertained that the occupiers of the farms were no better acquainted with the causes of the malady than at its commencement. As he had reason to believe that certain pastures on two farms in particular gave origin to the disease, and also that the water in the district was of a peculiar character, had recommended that a further investigation should be made by Dr. Voelcker, as chemist to the society, and by Professor Buckman, botanist, of the Royal Agricultural College of Cirencester, both of whom had prepared reports, which would also be read to the meeting. The chief business that day, therefore, would be the reading of these reports, which, with the discussion, which might possibly throw some light on the nature of the outbreak.

He would next observe that the disease designated splenic apoplexy was so called because, on making a *post-mortem* examination of an animal it was found that the spleen was enormously engorged with blood; besides which there was some reason to believe that this sudden engorgement of the organ was the chief cause of the fatality of the affection. He thought, however, that, on looking a little deeper into the matter, we

should be rather inclined to regard the sudden filling of the spleen with blood as the effect of a pre-existing morbid state of blood, and not the cause, and if so, "splenic apoplexy" might be considered a misnomer. The disease was in reality one in which some of the constituents of the blood, from various causes, underwent peculiar changes; and in consequence of the disturbed state of the organism thereby produced, the blood was brought to a stand-still in the spleen, and hence the large increase of its bulk. This being the case, the only use of retaining the term "splenic apoplexy" would be to distinguish one blood disease from another.

In all parts of the country a large quantity of cattle, sheep, and even pigs, were being lost from affections which clearly belonged to the blood. In some of these cases the constituents of the blood were increased in quantity, in others they were diminished, while in particular instances they had even undergone chemical changes. He would give some familiar examples. There is a disease called "black-leg" in cattle, which prevails in Yorkshire and in some other counties. It is the pest of many a farm, and a rearer of short-horn cattle, in particular, often, loses a great number of his young animals from the affection. He had named this disease *Hæmato-sepsis,* because of the septic condition of the blood with which it was associated. Then there is another malady, called "red water" in cattle, a disease to which cows are in some parts of the country more prone than oxen. It is a disease, too, in which the blood undergoes peculiar changes, and in which the albumen and also the colouring matter of the red cells are evacuated through the medium of the kidneys, constituting the affection now known as *Hæmo-albuminuria.* There are other cases, in which the blood is brought to a sudden stand-still, sometimes in one part of the body and sometimes in another. Cases of this sort occurred in Wales last year, and they were truly described as examples of stagnation of the blood—*Hæmostasia.* All these instances showed that there were several affections of a fatal character which primarily manifested themselves in certain changes of the blood, and he believed that splenic apoplexy was one of those affections. The causes which gave rise to blood affections were various. For example, the fluid was likely to become contaminated by the inhalation of any noxious material, and in very many instances life had been suddenly cut short by the influence of noxious vapours. Many persons had supposed that in splenic apoplexy the changes originally wrought in the blood were due to the inhalation of ordinary malaria. This opinion received some degree of support from the circumstance that

the malady generally showed itself during the summer months in districts where there was a large tract of low-lying land, which, for want of under-draining, yielded deleterious gases, from the operation of the sun's rays upon the decaying vegetable matter. But opposed to this view was the fact that, in the cases to which he should presently refer, the animals were attacked on pastures which were in every respect like others on which they remained healthy, and from which they were separated merely by ordinary ditches. It was on two pastures in particular on two farms, comprising about 300 acres of land each, that the disease had shown itself. He could not find here any cause which would lead to the supposition that malaria had anything to do with the matter. Again, if he took a more extended view, and looked at attacks of the disease in other districts, he should find these often occurring in winter, among animals being prepared for the butcher, fed largely on mangel-wurzel, oilcake, &c., and kept consequently under circumstances favorable to the continuance of health.

Another source of mischief was the direct conveyance into the digestive organs of materials detrimental to the making of pure blood, either in the shape of food or of water. We were often enabled to trace blood diseases directly to the food; but when he came to examine the cases in question, he could not find anything that would justify him in saying that materials of a poisonous nature had entered into the organism of the animals, and had excited a fermentive action in the blood. Professor Buckman would go more at length into this part of the subject, and would show the nature and character of the herbage in these particular fields. His own remarks had reference merely to the fact that in the careful examination which he had originally made he had failed to detect any poisonous plants in the pastures.

Water entered largely into the composition of the blood. There were no less than 784 parts of water in every 1000 parts of blood; and, as water often held in solution a variety of materials, and went directly, so to express it, into the vessels from the intestinal canals, by the simple law of endosmosis, it followed that matters detrimental to the blood might be thus conveyed into the system, and induce certain changes in the composition and character of the blood which might prove fatal to the life of the animal. In the district in question he found that the water was strongly impregnated with sulphuretted hydrogen.

He would now pass from this particular case to another, in order to show how water, or rather a want of it, might induce this disease. Two years ago he was consulted respecting an

extensive fatality among some cattle in Norfolk, said to arise from splenic apoplexy. It was during the winter months, and the animals were being fed on oilcake, roots, hay, &c. On investigation he was led to the conclusion that the water must be implicated in the production of the malady. He communicated that opinion to the gentleman to whom the animals belonged; when he received the quaint reply, "You never made a greater mistake, for it is my custom never to allow my animals any water at all while in the sheds." He (Professor Simonds) hesitated not to express his belief that it was a want of water which induced a diseased condition of the blood in this instance. Of course such a state of things was altogether opposed to nature. To understand this the better, he would again remind them of the large quantity of water that naturally existed in blood, as this would show how the blood would be altered in its fluidity by the depriving an animal of water. The case would also help to prove that there were changes wrought in the blood by causes the very opposite of each other.

An interesting question arose as to how far the spleen might be originally concerned in the production of a morbid state of the blood; and whether they were justified in regarding this affection as depending essentially on a change in the function of the spleen. The function of the spleen was, even at the present time, but ill understood, and its office might be said to be almost an enigma in science. On the one hand, many eminent physiologists were of opinion that the spleen was an organ that had to do with the disintegration of the red corpuscles of the blood, which became broken up in its structure; while, on the other hand, there were physiologists of equal eminence who declared that the spleen was a *preparer* of the red cells. The prevalence of these two opinions showed that the true physiology of the spleen was not well understood. If he might presume to give an opinion, he would say that he inclined to the view that the spleen was an organ which exerted a disintegrating power upon the red cells. He had been led to this conclusion by two or three different reasons. In the first place, he believed it was found that the total quantity of solid matter in the blood of the splenic vein was often less by upwards of one half than in the other vessels belonging to the so-called chylopoietic viscera. It was an anatomical fact also of great importance in determining this question that the splenic vein went to make up the vena portæ of the liver, in order that the liver might exert its functions in purifying the blood brought from the spleen of deleterious materials which had entered into it in common with the

organs of the chylopoietic viscera. He thought that if the splenic vein were carrying blood that was newly manufactured, and fitted for general circulation, it would not join the vena portæ, but be conveyed directly to the heart.

It was easy to understand that the spleen, if it became suddenly engorged, would have its function as a disintegrator of the blood-cell suspended, just as the function of any other organ was suspended when the blood within it was brought to a stand-still. As was well known, all the functions of life were suddenly cut short by a large quantity of blood being determined to the brain, constituting what was ordinarily known as apoplexy. So likewise if the spleen or any other organ received an undue quantity of blood, and this blood was suddenly brought to a stand-still, its function would become suspended. Therefore, although the engorgementof the spleen might be only an effect of the changed condition of the blood originally, yet when that engorgement took place, and the functions of the spleen were suspended, the blood was further deteriorated, and the death of the animal thereby facilitated. The capability of the spleen to receive a large amount of blood was, however, provided for naturally. Hence one other function of the organ was that of acting as a dilatable diverticulum for the blood, especially when obstructions existed in the vena portæ of the liver. If, therefore, the vena portæ was congested, the spleen would be suddenly increased in size; but when the congestion was removed, the blood would again flow from the spleen, and go rapidly through the liver.

It was, therefore, no positive proof of disease of the spleen that the organ was larger than commonly observed. If in this disease the spleen was simply enlarged, and no change wrought in the blood, we might then infer that this organ was chiefly at fault ; but when we make a *post-mortem* examination, and find other parts, distinct from the spleen affected, we might fairly conclude that the term "splenic apoplexy" was simply a misnomer, and that the enlargement was only a symptom of some other affection. In a *post-mortem* examination it would be observed that the small intestines, apart from the spleen altogether, were almost filled to repletion with blood, which had no power of coagulating, thus showing that it was changed in its vital properties. The intestines also had a blackened appearance, owing to an effusion of spoilt blood which had taken place within them.

On looking at the flesh of animals dying with the malady, extravasations of blood would likewise be frequently met

with. Here, again, was an example that the blood had left its vessels, and lay, as it were, in the interstices of the muscles. As with the abdominal effusions, so with those which took place in other organs of the body—the blood was always fluid.

It not unfrequently happened, if an animal bore up against the disease longer than was usual—the ordinary duration of the malady being seldom more than eighteen hours—such a change was wrought in the condition of the flesh as to render it poisonous to animals partaking of it. He had known the flesh to be thrown into a yard and eaten by pigs, and within a few hours afterwards the pigs died. Dogs had been affected in a similar manner. This still further showed that we were dealing with a disease which was truly one that produced chemical changes in the blood.

Referring again to the duration of the malady, he might observe that it was necessarily short. It was seldom that the animals attacked survived more than twenty-four hours; indeed the major part of them might be said to die within six or eight hours. Death sometimes took place even within two hours after the attack. If they examined the per-centage of the deaths they would, he believed, find that in ninety cases out of every hundred the animal died.

As to the symptoms, there were, as a rule, no premonitory ones. The animals were usually feeding, and apparently doing well up to the time of the attack. When the symptoms first showed themselves, they were also very often not of an alarming character. The animal stood with its back arched. It had a difficulty of progression, a staggering gait, and a twitching of the muscles. Paralysis succeeded. The countenance dull and dispirited, and the head pendulous; a frothy saliva came from the mouth; the breathing was laboured and difficult; and the pulse augmented, becoming tremulous and indistinct as the disease advanced. Colicky pains came on, and when effusion into the intestinal canal took place these griping pains were associated with diarrhœa and blood-coloured evacuations. The urine also was frequently discoloured with blood. The animal fell, and generally died in convulsions. The immediate cause of death was cerebral disturbance. Some animals would die frantic, while others died in a state of coma.

With regard to the treatment of the disease, no confidence could be placed in any one method in particular. All blood affections were exceedingly fatal, and generally ran their course so quickly that scarcely anything could be done to arrest them. They might, however, often prevent a disease of this kind;

and, indeed, prevention was the thing with which they were most concerned. But the prevention of the disease was rather a matter which would come out in the discussion. His object was not so much to give a complete lecture on splenic apoplexy as to make a few introductory remarks to the reading his report of the outbreak of the affection in the district in question. Having entered into the pathology of the disease, he would now read his

REPORT.

To the Veterinary Committee of the Royal Agricultural Society.

Gentlemen,—I have to report that, in accordance with your instructions, I have investigated the circumstances connected with a disease which has of late years prevailed among the cattle and sheep in the vicinity of Ilchester, to which your attention was recently directed by Sir William Miles, Bart. On the day preceding the one—March 19th— that I received your directions to visit the district in question, a report reached me from Mr. Blake, veterinary surgeon, of Yeovil, describing the somewhat sudden reappearance of the malady on one of the farms, after several weeks' cessation, he having been called upon to make a *post-mortem* examination of three cows which had died after a very short illness. Mr. Blake also forwarded the greater part of the viscera of one of the animals, thereby affording me an opportunity of studying the pathology of the malady prior to my visit. The lesions observed essentially consisted of an enormous engorgement of the spleen with grumous blood, and effusion of sanguineous fluid into the small intestines. The vessels of the mesentery, and especially those of the mesenteric glands, were likewise filled to repletion with black and partially coagulated blood. These appearances agreed with those which had been observed in the other cases by Mr. Blake, and clearly indicated that all the animals had fallen victims to the malady known as *splenic apoplexy*. From causes at present not well understood, attacks of splenic apoplexy have of late years been greatly on the increase, and under whatever circumstances they may have occurred they almost invariably have had a fatal result. The rapidity with which they progress is remarkable, the affected animals often dying within an hour or two of being observed to be unwell. Sometimes the animals will bear up against the disease for six or eight hours, but very rarely for more than twelve. A long duration is favorable to recovery, but not a positive proof that such will take place. The earliest symptoms are often not of an alarming character. The animal is mostly dull, and disinclined to move. It stands

with its head hanging down, ears lopped, and back arched. In other cases twitchings of the voluntary muscles are observed, with loss of power of progression, especially with the hinder limbs. The surface of the body is chilly, the gait staggering, and the mucous membranes injected. Defluxion of tears, increased mucous discharge from the nostrils, laboured and painful breathing, and a quick, weak, and wavering pulse, also attend the progress of the malady. As the disease advances to a fatal termination, colicky pains come on, which are associated with an irritable state of the bowels and blood-coloured evacuations. The cerebral functions become more and more impaired. Rigors show themselves, and the animal drops and dies, either in a semi-comatose state or, now and then, in strong convulsions.

From the evidence collected with reference to the cases in question, it appears that the disease was entirely unknown in the district until the summer of 1855. The outbreak, which cannot be accounted for, took place on a farm in the occupation of Mr. Edw. Look, of Ilchester. The farm consists of 300 acres, the greater part of which is pasture ground, lying in the valley of the Yeo. I learned from Mr. Look that in the month of August, 1855, he had thirty barren cows, varying in age from four to eight years, at pasture on a particular field—a piece of old feeding-ground—which had been going on to his perfect satisfaction up to the time of the appearance of the disease. These animals had been bought between Christmas and May-day, about which time they were turned out to graze. No indications of ill-health preceded the attack; but suddenly and within a few days thirteen of them died, some being found dead a few hours after being believed to be in perfect health. The remainder of the animals were at once disposed of, and within a day or two of the sale several more of them became affected and died. After their removal the pasture was fed with sheep during the latter part of the summer and the succeeding autumn, and a great many losses also occurred among these animals from the same disease.

The field in question, which, for distinction, I will name No. 1, is apparently a piece of good grazing ground. It lies on ridges, the valleys between which act as surface-drains. The greater portion of it is sufficiently dry, but the lowest parts would be improved by under draining. It contains twenty-seven acres, and is bounded on one side by the river Yeo, from which the animals obtain their drinking-water. It has been regularly fed since 1844. No difference could be detected by me between the grasses it bears and those

growing on the contiguous pastures, which hitherto have been perfectly free from the disease.

In the spring of 1856 some more cattle were turned into this field, and in the course of three weeks one of them died. The others were immediately removed, and with one exception they all did well. The animal thus alluded to died within two or three days of its removal.

The field was then shut up for mowing, and after the hay-making it was stocked with about a dozen *bulls*, all of which went on well. They were turned in almost immediately after the removal of the hay, and consequently before the growth of much after-grass.

In 1857 the same plan of mowing and stocking the after-grass with *bulls* was adopted, and without any loss.

In 1858, and also in 1859, the field was *partly* mown and partly fed with sheep. An occasional death took place among these animals.

In 1859 the disease appeared on another part of Mr. Look's farm—field No. 2, situated at a considerable distance from No. 1. It broke out among eleven feeding oxen, four of which were at once slaughtered. This also is seemingly a good piece of grazing land, and the animals pastured upon it have ready access to a brook of pure water.

In 1860 No. 1 was fed with sheep entirely, and the deaths being numerous, the animals were removed; after which the field was skimmed over with the scythe, and then fed with *bulls*, and again without any loss.

In this year two feeding cows died on No. 2. No loss occurred in No. 1 in 1861, although it was fed both with cattle and sheep. *It was, however, very heavily stocked.*

In 1861 many sheep were lost on No. 2. In February of the present year a horse and three sheep died on No. 2. The horse is said to have presented the same *post-mortem* appearances as the cattle and sheep, but scientific evidence is wanting on this point.

It is worthy of note that the sheep were only in the field for four or five hours, and on being put into another pasture, one died twelve hours afterwards, and the other two very early the next morning.

Mr. Look buys barren cows for fatting, and has had no cases of the disease on any other of the pastutes, nor while the animals have been kept in the yards prior to being turned out to graze. The yards are good, well sheltered, and cleanly kept, and the animals have a supply of very good water.

Mr. Wake's Farm.

This farm consists of 127 acres, all in one piece of pasture, being merely divided by some iron hurdles into four, or occasionally three parts, for the sake of convenience. It is contiguous to Mr. Look's, and only separated from field No. 2 by a narrow brook.

It is used as a dairy farm, and was in the occupation of Mr. Wake's father previously to Mr. Wake junior coming into possession at Lady-day, 1861. Mr. Wake's father kept, on an average, fifty-two head of cattle, including heifers and bulls. No disease existed among any of the animals before May, 1859, when the malady in question suddenly showed itself. Between May 11th and October 6th of this year seventeen died, one of the number being a bull. Some of the cows were in calf, others were milking, and a few of them grazing animals.

Immediately after these losses more cows were bought, so as to bring up the number to 50, and no deaths, occurred either among these or the old stock of the farm throughout the winter.

Besides the seventeen animals which died in 1859 three others were attacked, but in a milder form, and these recovered.

In the spring of 1860 six dairy cows and one bull were lost, after which the disease disappeared until February of the present year. The bull had been on the farm about two months, and was between two and three years of age. As previously stated, Mr. Wake junior, came into possession of the farm at Lady-day, 1861, and when he entered he brought with him from his previous occupation at Brougham, fourteen miles distant, thirty cows and heifers, of various ages. He also purchased twenty of the old stock belonging to his father. During the year eight of the cows brought from Brougham died, and two bulls which he had purchased soon after Lady-day, but one only of the old stock.

Two of the eight cows died in April, while feeding chiefly upon hay in the yard, going unto the pasture for a few hours only every day.

Another of the animals was milked in the evening, and yielded a full supply. She was shortly afterwards attacked, and died about 10 p.m.

The last animal which died on the farm was a cow kept principally in the shed on hay. Her death took place about the middle of February, 1861.

The sheds and yards are wet and dirty, and badly littered. The drinking-place is paved and walled with stones, and

the supply of fresh water to it is very insufficient. It receives a considerable amount of the drainage of the yard. The land is liable to flood, lying rather lower than many fields by which it is bounded. It is, nevertheless, of fair average quality, and its natural herbage has been somewhat improved by manuring, which is done at such a rate as to complete the whole in about every seven or eight years.

The cattle, when grazing, have access to pure water from the brook previously described.

Mr. Dykes' Farm.

The losses here have been only two. The land adjoins Mr. Wake's and is of the same description. The two animals died within a fortnight of each other in the spring of 1861. They were barren cows, bought for grazing.

Mr. Bradley's Farm.

This farm is situated in the parish of Sock, and is distant about a mile from the others. It is also a grazing farm, consisting of 350 acres, a small portion only of which is arable land.

Mr. Bradley has occupied the farm for twenty-nine years, and until the disease in question made its appearance has only lost animals now and then from ordinary causes. The parish of Sock contains only one other farm, which is in the occupation of Mr. Hussey, and it is a singular circumstance that no disease of the kind has ever existed here. This farm is precisely of the same nature and quality, and the system of grazing exactly the same. Many of the pastures are separated from Bradley's by ordinary water-courses only, and a good many of them are so situated as to unite Mr. Look's and Mr. Wake's farms with Mr. Bradley's.

It was in consequence of the disease having proved singularly destructive on Mr. Bradley's farm, and having continued, with few interruptions, down to the present time—March 24th—that Sir William Miles' attention was called to the subject, with a view to an inquiry being instituted by the society.

Mr. Bradley, like Mr. Look, has found that the losses have occurred when the animals have gone unto two fields in particular, which are numbered respectively on the plan of the farm 30 and 37.

The malady was first observed in July, 1861, having broken out among nineteen grazing animals, which were, with a milking cow, at pasture in the same field. They had been turned into this field on May 4th, and had continued there until July 3rd, going on quite satisfactorily. In consequence of

the keep becoming short at this date, the *nineteen grazing animals* were taken out of the field—and put into another—a piece of good feeding ground, locally designated "*tart land*," from its causing diarrhœa among the cattle when first placed upon it. Here they remained until the morning of the 7th, when they broke out, and were then turned into No. 30—a suspected field. They continued in No. 30 till the 10th, when they were returned to the original pasture, and where the cow had remained during the whole of this time. On the morning of the 11th four were found dead, and in consequence of this the remaining fifteen were taken into the yards and bled, and had administered to them some aperient medicine. Notwithstanding these precautionary measures, another of the animals died on the same day, and four more on the following day, the 12th. The remaining ten were again turned out, but into an unsuspected pasture, and of these, four died during the next day, the 13th.

The six animals which were left were afterwards kept off the suspected fields, and went on well. Two of them were sold for slaughtering a few weeks subsequently, being in good condition, and the other four during the autumn. The cow also, which, it has been shown, did not go unto the suspected land, has continued well down to the present time. She was neither bled nor physicked. The piece of "tart land," on which the animals were placed on the 3rd of July, and where they remained till the 7th, when they broke out, is not thought to be injurious, in so far as the production of splenic apoplexy is concerned, because neither sheep nor cattle have ever died while upon it.

On the 26th of July the disease showed itself among another lot of fifteen grazing animals which had been on the farm for about four months. They were at pasture at the time on No. 37, not until then a suspected field. Three of the animals died on this day. The remaining twelve were then taken out, and no more deaths occurred. The field was then shut up and afterwards mowed.

On August the 27th a beast, which had been kept quite apart from the other animals, was put into the pasture adjoining No. 37, and was found dead in a secluded spot, after being missed for two or three days. This case is thought, however, to be a doubtful one of the disease.

During the latter part of the summer two colts at pasture on No. 30 died, and, as is believed, from the same disease.

On September 12th a beast died on No. 37. Had not been on No. 30.

On October 9th another beast died on No. 37, which also had not been on No. 30.

On December 22nd a third died *in the fold-yard* It was one of eight, and was being fed at the time chiefly on hay, none of which, however, came from the field No. 37.

After this time the disease disappeared until the month of March in the present year.

On the 14th of this month a bullock feeding on hay in the yards died suddenly, a second on the 15th, and a third on the 16th. These are the three animals previously spoken of as having been examined *post-mortem* by Mr. Blake, and the viscera of one of which was forwarded for my inspetion. They were part of a lot of ten bought on February 14th, at Bath fair, of the breeder. On their arrival at Sock, seven were selected from them and placed in the yards, and the remaining three were turned into the pastures, the suspected fields being avoided. These, with the four still in yards, were well at the time of my visit. The hay supplied to the animals came from different fields, and only about two loads of it from No. 30, none of which, it is thought, has yet been consumed.

I come now to the evidence obtained with reference to the deaths of the sheep on this farm.

In June, 1861, there were 205 shearling wethers grazing on different parts of the farm, and having free access to No. 30. Fifteen of these died between a Wednesday and Saturday, in consequence of which ninety were selected from out of the remainder and sent to the metropolitan market on the Saturday, four of which died on the journey. On the Monday following—the 1st of July—thirty more of the sheep were sold to a dealer, three of which died in a day or two afterwards. On this same day, also, Mr. Bradley lost two more out of the number remaining in hand. Those left were now put on vetches, which were rather a poor crop, and they were kept on them consequently only for a week. After this they returned to the pasture grounds, but were prevented going into No. 30. No further deaths took place. Since this time, other sheep on the farm have died at irregular intervals, down to February 1st, amounting in all to about thirty.

On the 5th of March last Mr. Bradley, with a view of arresting the progress of the malady, and to test the preventive properties of salt in doing this, applied 9 cwt. per acre, of this material to the field No. 30. He then drew out ten shearling-wethers from 140, and turned them into the field on March 7th. One of these animals died on the 15th. After this the nine were removed for five days, and then turned into the field again, without any additional death, however,

up to the day of my visit. The experience of Mr. Bradley seems to show that if sheep are allowed to pasture on the suspicious grounds only for a few hours, they will take a sufficient amount of deleterious matter to produce their death a day or two afterwards. He considers the after grass not to be so dangerous as that first grown, but he has no experience of bulls being less susceptible of the affection than other cattle.

Splenic apoplexy is essentially a blood disease, consequently it is not difficult for a pathologist to understand that it may arise from a variety of causes, any one of which is calculated to effect changes either in the quantity or condition of the several constituents of the fluid.

In investigating the causes, I was led to inquire into the water supply to the cattle when in the yards, especially as the three last animals had been lost while they had been exclusively confined to these, and while also they were being fed entirely on hay. On inspecting the yards, I found them badly arranged, and by no means adapted for the preservation of the health of animals. This is particularly the case with the yards at the back of the house, where the animals alluded to had died. The feeding-bins, which are built of stone, are so placed that the water from the buildings runs towards them, and accumulates to such an extent that the cattle have to stand mid-leg deep in liquid manure, notwithstanding they may be fairly supplied with straw. The drinking-place is placed at even a lower level, and becomes a receptacle for so large an amount of the drainage of the yard that, but for a small flow of water from an adjacent pond conducted through it, the animals would be unable to obtain little else than their own evacuations diluted with the ordinary rain-fall. Nothing could be more objectionable than the water they had to drink. The other yards are somewhat better arranged, but still open to great improvements, both with regard to the supply of water and the comfort of the animals while at their feeding-bins. The drinking-place in one—the inner—yard receives a considerable portion of the drainage of the other, and it is worthy of note that the bullock which died in December was placed in this yard. A small stream flows at the bottom of both these yards, so that the animals in the outer one can get good water, while those in the inner are compelled to drink it after it has become charged to some extent with drainage matters. In the absence of any other cause, I cannot but attribute the cases which occurred in December and also in March to the general want of comfort afforded to the animals, and their drinking of water being charged with feculent matters — two things necessarily associated with the bad construction of the yards.

The cases, however, which have occurred during the summer months must have depended on causes of a totally different kind, and a further investigation may show that they were probably due to the general character of the herbage of the pastures on which the animals were placed. It has been already shown that the animals, when at pasture, can obtain a supply of good water, either from the river Yeo or from adjacent brooks, but, nevertheless, the entire water question requires a strict examination. Like many parts of Somersetshire, the district abounds in land locally called "tart land," the herbage of which produces diarrhœa often to an alarming extent among the cattle. The real cause of "tartness" would appear not to be well understood, and scientific researches are therefore required for the proper solution of the problem. The character of the water in some places, apart from the herbage, is known to produce diarrhœa; and it not unfrequently happens that this condition of the water and "tart land" are combined. It does not, however, appear that "tart land" exercises any influence in the production of splenic apoplexy, or, at any rate, it seems not to have done so in the present instances. Were it otherwise, the disease would have been far more frequent in its occurrence than it has been, and would also of necessity have persisted where the "tart land" exists.

It is a remarkable circumstance that in the parish of Sock, and also in the adjoining one of Tintinhull, the water, which is obtained by the sinking of wells on land which rises a few feet above the level of the valley of the Yeo, is so impregnated with sulphuretted hydrogen that it can only be used for ordinary cleansing purposes. On these farms the occupiers are obliged to collect rain-water from the roofs of the buildings for drinking and culinary uses. The fetor of the well-water is at times almost unbearable on being drawn by the pumps belonging to farm-residences.

On the farm in the occupation of Mr. Bradley the surplus of the house water from the pump mixes with the fetid sewage, and also partly with the drainage of the cattle-yards, and then finds its way to the bottom of the meadow No. 30, in which many animals have died; but it does not go near to the other meadows where also the disease has manifested itself. Besides this, No. 30 meadow, which has a considerable fall from its upper to its lower part, is so situated as to induce the belief that water, charged with organic matters which yield sulphuretted hydrogen, may percolate the sides of the slope and impart some deleterious principles to the herbage. This is a point which requires further inves-

tigation, and should be undertaken by those who possess a chemical and also a geological knowledge. To show the singular geological condition of the locality, I may state that Mr. Bradley, some years since, with a view of getting good water for his house, sunk a well on the level of the valley, and within a hundred and twenty yards of the original one, which yielded water so impregnated with saline matters that it also could not be used.

On inquiring into the water supply on Mr. Hussey's farm, which up to the present time has been perfectly free from the disease, I ascertained that about six years since a well, which yielded fetid water, was covered in, and the water from a brook diverted so as to supply a tank, from which it is pumped for the use of the cattle.

This was done in consequence of the animals refusing to drink the fetid water, or when doing so becoming attacked with diarrhœa. The tank is situated about forty feet from the well, and at times its water has a slight unpleasant smell, arising, as is supposed, from leakage, either from the well or from the surrounding soil.

My next visit was to Mr. Taylor's farm at Tintinhull, and was made chiefly because I was informed that the cattle here *constantly drank fetid water*, and that their health was in no way affected. On inspecting the premises, however, I found that this was not the case, and that the term "bad water" was used synonymously with fetid water. The water given to the cattle is drawn from a pump in the shed, and is conducted by pipes into small drinking-troughs made of iron, and placed in front of the stalls. It is apparently largely impregnated with the salts of lime, has a somewhat chalybeate taste, and is not very clear; but, nevertheless, it is not more objectionable for animals than most hard waters. The well yielding the fetid water is situated within fifty yards of this one, and was originally made with a hope of obtaining water less turbid and better suited for domestic purposes. It is uncovered, and, on gauging it, I found it was only twenty-seven feet deep, fifteen of which were occupied with water, so that it would appear that the organic matters which produce the sulphuretted hydrogen are superficially placed in the soil. It is a singular fact connected with this well, that the water was comparatively sweet until a leaden pipe connected with a pump near the house was placed in it, with a view to obviate the trouble of going each time to the well for water. The first water drawn from the pump in the morning is not only so exceedingly fetid as scarcely to be borne, but is dark in colour; and although this colour soon passes off, the fetor

is always very much greater than that of the water in the well.

The facts thus reported upon show the necessity of a chemical examination of the waters of the district, and also the necessity of a botanical examination of the herbage, and as such my investigations are to be considered as preliminary rather than otherwise. Already several samples of water have been sent to Professor Voelcker, and will doubtless be, in due time, reported upon. These waters were taken from Mr. Bradley's farm, and consisted—1st, of water from the pump; 2dly, from the drinking-place in the cattle-yard behind the house; and 3dly, from the ditch which flows directly into the drinking-place from the pond previously described. In addition to the chemical and botanical investigations, I would suggest that, to lessen the effects of some of the causes in a practical manner, the suspected fields be thoroughly underdrained, and be dressed with lime. That, instead of being fed in the spring, they be shut up for mowing, and afterwards stocked heavily with strong-constitutioned animals; and, as further precaution for preserving the health of the cattle in the yards during the winter, that the hay taken from these fields be well salted when being put into the stack.

As further preventives in Mr. Bradley's case, I would suggest that the cattle-yards be entirely remodelled, so as to prevent the animals standing up to their knees in wet and filth while at the feeding-bins; and that means be taken to give them a supply of pure water to drink, by conducting the streams now passing through them into stone tanks placed above the level of the drainage of the yards.

As these things belong rather to the future than the present, I have recommended Mr. Bradley to supply his animals with an improved diet, by adding some cake, corn, or bran daily, with good hay-chaff, to their ordinary allowance of hay, so as to lay the foundation for a better quality of blood. With a further view also of keeping their systems in a state better calculated to resist the disease, I have advised that an occasional dose of aperient medicine, consisting simply of Epsom salts, with a little ginger, be given, and after its effects have passed off, that each animal take two drachms of nitrate of potash, mixed with a bran mash, for two or three days in succession. It is to be hoped that these means may prove beneficial; but prevention of the disease during the winter months must, in Mr. Bradley's case, be mainly based on sanitary improvements. Subsequently to my inspection I received from Mr. Bradley the carcass of a sheep which had died very suddenly on the field No. 30, making the second

which had been lost after the application of the salt. The lesions which were discovered on the examination distinctly proved that the animal had sunk from the same disease. The blood was everywhere black in colour and only partially coagulated, and the spleen was enlarged to about three times its natural size. In concluding this report I would express a hope that the causes of this fatal malady may yet be made evident by the co-operation of the chemist, the botanist, and the animal pathologist, so as to lead to the adoption of effectual preventive measures.

(Signed) JAS. B. SIMONDS.

Report of the examination of the Pastures in the neighbourhood of Ilchester, Somerset. By PROFESSOR BUCKMAN.

The little town of Ilchester is situate on an alluvial plain, through the centre of which the river Yeo takes its more or less winding course.

This river flat, which varies in width to as much as five miles, has a subsoil of alluvial mud and sand, intermixed with more or less of the southern or flint drift.

The land, which is in grass, is subject to flooding from the Yeo and its tributaries, and is distinguished by the terms, "useful meadow," "marsh," or "moorland," according as it offers facilities for preventing the stagnation of the water, and so will pay for manuring and other cultivative processes. These flat meadows may further be said to occupy a valley of denudation in the Lower Lias shales, the spoils of which. mixed with sandy silt and the flint drifts before mentioned, form the subsoil of the valley, which latter is bounded by low eminences, whose washed sides present the stiff intractile soil so characteristic of "*unmitigated blue lias.*"

Now these two positions, namely, the river flats on the one hand and the liassic elevations on the other, are here remarkable as being concerned in the production of two kinds of disease in the animals that feed upon the pastures. Thus, the lowlands are dotted with meadows which the farmers point out as having been fatal to the cattle and sheep which have fed upon them, producing a malady which has been described as "splenic apoplexy," whilst the higher meadows have the name of "scouring" or "tart lands."

It should here be mentioned that the well waters which I tasted were all more or less of a medicinal class. The water from some wells at Bierly Farm, Tintinhull, and Sock, for example, being strongly impregnated with sul-

phuretted hydrogen, whilst that of others might be described as *mineral* or *saline* waters. In fact, the waters reminded me very forcibly of those in the vale of Gloucester. At Cheltenham and Gloucester, the different waters of the various "spas" would appear not only to be like those of Somerset in chemical composition, but to be also derived from the same *formation* and under like geological conditions. The facts so far described were noted on the 20th of June, on which day, at the request of the Secretary of your Society, I proceeded in company with Professor Simonds to the neighbourhood of Ilchester. The following day was devoted to an examination chiefly of the herbage of the district; the results of which I now lay before the society.

On visiting Bierly Farm, I first examined the water of two wells:

Well 1.—Twenty-seven feet deep, had twelve feet of highly fœtid sulphur water.

Well 2.—Pronounced to be good water by the farmer, Mr. Taylor. It is about fifty yards from No. 1, and said to be eighteen feet deep. The water, judging from the taste, is impregnated with iron.

The ditch-water of this farm is considered good.

A large upland meadow on this farm was pointed out as being "very TART;" in this, the following were the prevailing plants:

Ranunculus bulbosus.—(Bulbous buttercup), *Cynosuras cristatus,* (crested dogstail,) *Avena flavescens* (yellow oat-like grass), *Dactylis glomerata.*—(Cocksfoot).

Here the great mass of the bulbous crowfoot and the dogstail is highly significant of a poor hungry pasture.

From this farm we proceeded to Sock, where I would first note that the open farm-yards are bounded by buildings with large roofs and with no spouts to carry off the water. Under such circumstances, the cattle must triturate their manure with the rain that falls, and with the juices oozing therefrom their drinking-water becomes contaminated.

On this farm, field No. 18, described as "tart land," is much out of condition from want of drainage. I would here note that most of these tart lands suffer for want of under drainage; they are poor, hungry clays, on which manure is found not to exert the influence that might be expected, and, indeed, that it undoubtedly would do if preceded by draining. The following is a list of some of the observed plants to which I have attached numerals expressive of their quan-

tities. This list and the successive ones, though not pretending to be complete, is near enough for all practical purposes.

Plants in Field 18, *Sock Farm.*

Botanical Name.	*Trivial Name.*	*Proportionals.*
Ranunculus bulbosus	Bulbous butter-cup	10
,, acris	Upright ,,	5
Carduus arvensis	Creeping thistle	8
Potentilla anserina	Silver weed	12
Trifolium	Clovers	1
Cynosurus cristatus	Crested dogstail	20
Aira cæspitosa	Tussac grass	5
Poa trivialis	Rough-stalked meadow grass	5
Hordeum pr tense	Meadow barley	1
Festuca prat nse	Meadow fescue	scarcely re-
Solium perenne	Rye grass	presented.
Carices	Sedges, *var.*	6
Junci	Rushes, *var.*	3
Herbs of a good kind barely represented.		

In this field we have bad herbage in the ascendant. All the plants, including the mass of the grasses, show a mixed condition of poor land both wet and dry. Anything like good species of grasses are only just indicated, there being an occasional sprinkling of such, and little more than this of the clovers.

The next three meadows, namely:

1st, No. 23 and 24.—"Higher Carey's Mead," now in hay; is better than No. 18.

2nd, No. 28.—"Middle Carey's Mead," a low meadow flooded in winter; mown for twenty-five years; this year in pasture.

3rd, No. 29.—"Lower Carey's Mead," much drier than No. 28; now in pasture.

These three meadows are not tart, or, if so, it is only to a slight degree in the upper one. They differ much in quality, the last being much the best, arising partly from its being in a sounder state.

Plants in Fields 28 *and* 29.

Botanical Name.	*Trivial Name.*	*Proportionals.*	
		No. 28.	*No.* 29.
Ranunculus acris	Upright butter-cup	20	10
Trifolium pratense	Red clover	—	3
„ repens	Dutch clover	—	2
Aira cæspitosa	Tussack grass	10	3
Cynosurus cristatus	Crested dogstail	6	5
Holcus lanatus	Wooly soft grass	4	2
Hordeum pratense	Meadow wild barley	3	2
Briza media	Quaking grass	2	1
Poa trivialis	Rough-stalked meadow grass	6	5
„ pratensis	Smooth „ „	3	6
Festuca pratensis „ loliacea	Meadow fescue, varieties	4	6
Bromus commutatus	Tumid field brome	3	3
Lolium perenne	Rye grass	3	6
Anthoxanthum odoratum	Sweet vernal grass	2	3
Carices	Sedges in the grips	5	—
Junci	Rushes „	4	—
Good herbage		15	21

A comparison of the grasses in these meadows will be sufficient to show the difference. Bad plants, grasses, and otherwise, prevailing in twenty-eight, whilst in twenty-nine these are much less, and good grasses more plentiful.

I would now direct attention to Mr. Hussey's field, which is said to be very tart. This is quite on the upland or lias elevation and was described to me as being exceedingly rich; so much so, indeed, that it had been mown for twenty years without any dressing. It was pronounced to have "looked beautiful in spring." At the time of my visit it had been depastured, and I saw the second growth of fresh grass, which certainly was not deficient in quantity; however, as regards its quality I can only pronounce that the species of grass show a soil with sufficient moisture, but cold and poor.

The prevailing grasses are as follows; placed somewhat in their order of frequency:

Arrhenatherum avenaceum (oat-like grass.)
Poa trivialis (rough-stalked meadow.)
Holcus lanatus (wooly, soft, grass.)
Hordeum pratense (meadow wild barley.)

Cynosurus cristatus (crested dogtail.)
Bromus mollis (soft brome or lop.)
Dactylis glomerata (cocksfoot.)
Festuca duriuscula (hard fescue.)
Lolium perenne nearly absent.

Clovers only in very small quantity, and I think the prevailing species is *Trifolium fragiferum* (strawberry-headed trefoil) a denizen of lumpy clays, often mistaken for the Dutch clover. Upon this point, however, I am not certain, as I could not find a specimen in flower.

From these observations on the tart lands which came under my notice, I am induced to conclude that they are poor, cold, "hungry clays." They want draining *as much to let the air into the soil as to get the water through and out of it*; after which, liberal manuring will be found to act, though now I am told these lands are not manured, as they are said "not to be grateful for it."

Since the above notes were penned, I have seen a paper by Prof. Voelcker on the 'Tart Lands of Central Somerset,' from which I take the liberty of quoting a concluding note of Lord Portman:

"I am of opinion," writes his lordship, "from what I have tried and observed on the "tart" lands of Pylle, where, I regret, Professor Voelcker has not made an inspection, that the plough is the true remedy, and all "tart lands" should be converted into arable lands. The clover-hay, the pasture on the clover-lea, and the roots fed by sheep on such land have no scouring properties; and, after a fair trial of some bad scouring lands, I have advised my tenant to break up and cultivate several scouring fields, which will, as I believe, be profitable instead of noxious land."—Lord Portman in the '*Bath and West of England Agricultural Journal.*'

I would remark that this is an opinion clearly borne out by the botany of the "tart lands," near Ilchester. Arable cultivation, however, would be very imperfect if not preceded by draining, and these would then be strong yielding lands with the usual manuring in the different rotations. So thoroughly am I convinced, that if found desirable to retain them as pasture, they may be made to yield good herbage of a wholesome kind as the result of cultivation. The more meadows of this kind are cultivated, the less frequent will become the poorer grasses, which yield pasturage and hay with what the farmers call "no proof," in it, while the better kinds at the same time will gain a complete ascendancy.

The meadows next to be described are those in which have occurred cases of "splenic apoplexy."

I first notice No. 30 on Mr. Bradley's farm at Sock. This meadow is on a gentle slope, the lower half of which is a poor swamp the upper portion sounder and with better herbage; the prevailing plants in the lower part are separated from those of the upper portion. It will be seen that the mass of the herbage in the flat is composed of the marsh thistle, sedges, and rushes, whilst the upper portion consists of grasses and clovers.

Plants in No. 30 Sock.

Botanical Name.	*Trivial Name.*	*Proportionals.*	
		Flat.	*Upland*
Carduus arvensis	Creeping thistle	—	3
,, palustris	Marsh plume thistle	10	—
Carices	Sedges	10	—
Junci	Rushes	5	—
Ranunculus acris	Upright buttercup	5	—
,, bulbosus	Bulbous ,,	—	2
Hordeum pratense	Meadow wild barley	3	1
Cynosurus cristatus	Crested dogstail	1	2
Aira cæspitosa	Tussac grass	5	—
Arrhenatherum avenaceum	Oat-like grass	—	2
Lolium perenne	Perennial rye-grass	—	3
Festuca duriuscula	Hard fescue	—	3
,, pratensis	Meadow fescue	—	2
Poa trivialis	Rough-stalked meadow grass	5	3
,, pratensis	Smooth ,, ,,	—	3
Dactylis glomerata	Cocksfoot	—	6
Holcus lanatus	Woolly soft grass	3	3
Arena flavescens	Yellow oat-like glass	1	1
Trifolium pratense	Red clover	1	3
,, medium	Dutch clover	1	2
Œnanthe pimpinelloides	Water dropwort*	1	—
Good herbage		5	24

Taking this field as a whole, my conclusions are, that underdrainage and liberal treatment would tend to the removal of disease, as by such means the poorer sorts of meadow plants, including the poor grasses, would be discouraged and die out, whilst the better kinds would increase.

That land of this kind is productive as arable was made manifest by the appearance of a fine crop of wheat in a field adjoining No. 30; still the peculiar nature of the stiff soil is

* The repetition of this and other plants of old salt marshes in this district is very interesting

even here made known by the presence of the corn buttercup (*Ranunculus arvensis*).

I next direct attention to No. 39, which was described as a meadow which had produced "splenic apoplexy," but in a minor degree to that of No. 30. It was remarked as generally free from thistles and large weeds, if we except the prevailing plant of these marsh lands, namely, *Ranunculus acris.*

Among the grasses will be noticed te *Anthoxanthum odoratum* (the sweet vernal grass) to the spicy character of which I am inclined to attribute its improved quality when compared with No. 30.

Plants in No. 37.

Botanical Name.	*Trivial Name.*	*Proportionals.*
Ranunculus acris	Upright buttercup	15
Aira cæspitosa	Tussac grass	10
Cynosurus cristatus	Crested dogstail grass	10
Bromus commutatus	Tumid field brome grass	3
Poa trivialis	Rough-stalked meadow grass	3
Holcus lanatus	Woolly soft grass	5
Anthoxanthum odoratum	Sweet vernal grass	2
Alopecurus pratensis	Meadow foxtail	1
Trifolium pratense	Red clover	3
Good herbage		12

The above makes soft hay of the kind, which is said to be wanting in "proof." The absence of rye-grass and fescues is very observable.

This meadow, though under water in winter, was not swampy, like parts of No. 30, at the time of my visit.

The next field to be described is situate near the Victoria Inn, Ilchester. It is constantly cut for hay, the practice being on this farm "to always mow the same land and manure it, and to let the feeding land take care of itself." The principle at the bottom of this practice apparently being that the better pastures yield more and better hay, as being sounder and drier, and therefore can be manured to advantage; while the low meadows do not yield good hay, and if quite exhausted by frequent haymaking, manures will not act by reason of the stagnant condition of the water.

Plants in Meadow near the Victoria.

Botanical Name.	*Trivial Name.*	*Proportionals.*
Ranunculus acris	Upright crowfoot	10
Aira cæspitosa*	Tussac grass	5
Cynosurus cristatus	Crested dogstail	5
Hordeum pratense	Meadow wild barley	3
Holcus lanatus	Woolly soft grass	2
Alopecurus pratensis	Meadow foxtail	3
Lolium perenne	Perennial rye grass	3
Anthoxanthum odoratum	Sweet vernal grass	3
Festuca pratensis	Meadow fescue	2
Avena flavescens	Yellow oat grass	1
Trifolium	Trefoils	4
Good herbage . . .	. . . . .	18

This field I should have expected would be free from diseases; and I have no hesitation in affirming that, in no case of what was described as "diseased ground," did I find any thing like the quantity of the last six plants in the above list.

Beyond the above field is a large tract of ground, which is flat and marshy; here occurs a field divided into three parts, in the occupation of Mr. Wake.

These three parts were described as varying in their power to produce disease.

The whole hundred acres were tolerably free from good grasses; these, however, were more plentiful in the higher part, which had been more often manured "because it pays better," and here *there has not been so much disease.*

It should be noted that in one part of the field described as *sound,* and certainly dry on the occasion of my visit, I yet observed a considerable quantity of *Alopecurus geniculatus* (*floating* (!) *foxtail*), a plant which sufficiently indicates that wet prevails over the greater part of the year. Here one does not wonder that there should be disease.

It now remains to notice Mr. Look's meadows, which I shall first do in the order in which I saw them, commenting more particularly upon them afterwards.

First we went through some sound pastures, in which good grasses abounded. In them there had been no disease.

* In this instance the tussac grass was diffused with the rest of the herbage, not in bull pates, as it occurs in wet or stagnant spots.

"Middle and home ground."—Little of good grasses; grips full of *Aira cæspitosa:* disease.

"Pill-Bridge ground."—Laid down six years; rye-grass, and Dutch clover prevails; no disease.

"Beaton's Leas."—Improved by cutting up the tussac grass. Considers it at present the best meadow in summer.

"Little Foot's Mead."—Good grasses prevail; buttercups few; dry: no disease.

"Raymond's Ground."—A dry pasture; cutting a fair weight of grass; but this consists of inferior species.

"Webb's Ground."—A dry soil, of the same kind as the last, only parted by a hedge. This field has been manured six or seven times in ten years. Some ten years since it did not belong to the farm; it had been badly treated, but is now improving There were cases of disease here in 1859.

The analysis of the herbage of these two fields is given by way of contrast with that on Mr. Bradly's farm. From this it will be seen they are free from plants other than grasses, or which were so scarce as not to be worth noticing.

Plants in (1) *Raymond's Ground* (2) *Webb's Ground.*

Botanical Name.	*Trivial Name.*	*Proportionals.*	
		1.	2.
Bromus mollis	Soft brome, or lop grass	20	—
Hordeum pratense	Meadow barley	10	5
Cynosurus cristatus	Crested dogstail	5	2
Lolium perenne	Rye-grass	3	3
Dactylis glomerata	Cocksfoot	1	—
Holcus lanatus	Woolly soft grass	3	10
Avena flavescens	Oat-like grass	—	5
Anthoxanthum odoratum	Sweet vernal grass	—	1
Trifolium pratense	Red clover	3	—
„ repens	Dutch clover		
		12	13

These two lists offer some curious distinctions, the quantity of lop in (1), and its absence in (2). In (2) the lop was remarked as small in size, and it was found only to have been sown in 1861. Sowing good grasses with clovers may be mentioned as a plan for ameliorating these pastures, if united with manuring and less hay-making.

A general review of the pastures of this farm offers con-

vincing proof that although drainage has not been overlooked nor cultivation neglected, yet that there is great poverty not so much in the quantity as in the quality of the herbage; and this poverty has not so much reference to poorly grown good species as in the general absence of these, and the abundant presence of the more innutritious kinds. These pastures as a whole appear to me to have undergone in past years exhaustive treatment, and though now beginning to improve, they will yet require a long time to get them to what they may become.

As a summary of the whole subject of my inquiry, I would remark in conclusion:

1st.—That the tart lands of Somerset are situate for the most part on poor unmitigated lias clays, which from the want of cultivation yield an abundance of poor species of fodder plants and a paucity of good kinds.

2nd.—That drainage by letting water and air through the soil would be of benefit in altering the mechanical texture of the land; whilst mowing would have the action of encouraging the growth of good grasses and discouraging the bad.

3rd.—That though the saline and medicinal waters which abound in these meadows may aid in the observed effects upon cattle; yet that the basis of the mischief is poor herbage.

4th.—As regards the pastures producing splenic apoplexy—these are for the most part in low positions, subject to floodings from the river Yeo, and its tributaries. They are more or less marshy and stagnant. They contain a mass of weeds (*e.g.* the *Ranunculus acris,* carices rushes, &c.), or no use, and of grasses so rough or so poor as to be little better than weeds.

5th.—These meadows, where subject to floods, if they cannot be controlled, may yet be greatly relieved by such drainage as the circumstances will allow.

6th.—It must be admitted that on Mr. Looks' farm there is a better appearance of things; the pastures are not so wet, and he is trying to introduce better grasses and clovers into them, but that even here the mass of the present herbage consists of poor innutritious grasses I have no doubt.

7th and lastly.—I would beg to record the opinion that when as much science is brought to bear upon the cultivation of pasture as of arable land, these pastures will then be greatly improved, and that such improvement will be marked by an increase of plants now as it were struggling for existence, and a corresponding extermination of such as mark either wet,

exhaustion, or natural poverty, or a combination of these conditions. To this end, I would venture to suggest that the arterial drainage of the *whole district* should be looked to, and that the system of always taking hay from one meadow and depasturing another, should be be inquired into, and, consequent upon this, an attempt should be made to weed, and to introduce, where absent, some better species of herbage to replace the poorer kinds.

Professor VOELCKER followed, and remarked that he had a very short report to make. All he had to speak of was, that he had analysed four different kinds of water, and that among them there was only one which was not largely impregnated with enough of both mineral and organic matter to produce disease. One sample in particular contained no less than 235 grains of solid matter in the imperial gallon, composed of various medicinal salts, which must necessarily affect the whole constitution of animals. He did not feel in the least surprised that animals supplied with such water had become the subjects of serious disease.

The CHAIRMAN: What water was it?

Professor VOELCKER said the water was taken from the pump at Mr. Bradley's farm. It was clear-looking water, but was nevertheless very foul indeed. Among other things, it contained nitric acid, as much as one grain to the imperial gallon, and nineteen grains of organic matter; showing that, somehow or other, refuse materials had accumulated near to the surface of the soil, underwent regular nitrification, and found their way, in a more or less changed state, into the whole of the pump water. Then, again, there was a large proportion of sulphate of soda present, besides sulphate of lime, sulphate of magnesia, and some sulphate of potash. These were salts which in their combinations had a medicinal effect very much greater than that which they produced separately. It was a well-known fact that in certain districts of Somersetshire, where tart or scouring lands prevailed, medicinal effects frequently occurred from the water. Referring to the composition of some water in a district near Bridgwater, he found that it contained 202 grains to the imperial gallon, while the water on Mr. Bradley's farm contained 235 grains. It was, unquestionably, mineral water, a single tumblerful of it taken in the morning being sufficient to produce a decided effect on the intestines. There could be no question, then, that in a lias district there were materials in the waters having a tendency to produce disease; whether it were splenic apoplexy, scouring, or some other affection, he could not say, but that such water could not be drunk with impunity was certain.

Another sample of water was evidently largely impregnated with the drainings of the farmyard, and the evacuations of the animals. It must be undesirable that animals should drink this water, as all such impurities were highly injurious. The ditch water, a third sample, and apparently foul, proved on analysis to be the purest of any. It was found to contain only twenty-six grains of solid matter to the imperial gallon, and in this matter there were only four and a half grains of organic constituents.

The well water at Tintinhull was a hard water, which he would not recommend any one to use permanently, although the animals apparently were uninjured by it. It contained some iron in solution, which tended to counteract its otherwise injurious influences. Another sample of water taken from a second well at Tintinhull, near to the one just alluded to, had, when he received it, no fœtid smell; but it soon developed sulphuretted hydrogen in considerable quantities, which evidently arose, not so much from organic matter, as from the reduction of the salts of lime and other minerals. The leaden pipe, to which Professor Simonds had referred, would exercise a somewhat complicated chemical action and increase the fœtor; the black colour arose from the production of sulphuretted lead. If he understood the matter aright, this disease prevailed in the lias district in Somersetshire.

Professor Buckman. Not so much on the lias clays as on the lands adjoining them.

Professor Voelcker continued:—On the tart lands prevailing on the lias clays, the herbage frequently remained unripe, and in this condition it produced several disorders. It might be worth while to chemically examine the herbage of the meadows where splenic apoplexy occurred, in order to ascertain whether an unripe condition of the grasses had anything to do with the disease. As regarded the condition of the herbage, he had found a remarkable difference between sound pasture and the pasture of scouring lands. Peats always produced sound herbage. There were clays which were well-drained, but which nevertheless required to be exposed to the air and cultivated, and for which he believed the only remedy was the plough. They were naturally rich; they were not poor in the sense of a deficiency of food; there was plenty of animal and plant food in the soil, but it was all locked up, and it was for this reason that the herbage did not get ripe. He had found great differences in the chemical composition of the perfectly ripe produce of peat and the unripe herbage of scouring lands, and, he repeated, that it would be interesting to ascertain whether a similar difference existed in the pasturage of soils where splenic apoplexy occurred.

In conclusion, he would observe that the causes which produced scouring appeared to have some common origin with those which produced splenic apoplexy. In that view he might be mistaken; but it was certainly a fact that, on lias-clays, the produce did not get ripe, and, being consumed in an unripe state, it produced all kinds of diseases. It was a curious thing that manuring had an effect the very reverse of what they would expect on the scouring land of central Somersetshire; it made the evil worse. In a wet season, when one would expect to see the disease, it did not appear; while in a dry summer, when there was a less rapid growth of vegetation, it was most dangerous to put cattle on the land. It was in a dry summer that the meadows scoured most.

Colonel Challoner said it was an every-day question among farmers whether the water that cattle drank from a pond, into which the drainage of the farm-yard ran, was or was not detrimental. He would be glad if their chemical and veterinary professors could give them some definite information on that point.

Professor Voelcker said many samples of water which looked like the very essence of the manure heap had on analysis been found to contain but little deleterious matter. Indeed, such water frequently contained much less of such matters than clear water. It was a remarkable fact that some of the clearest, best-tasting, and apparently most wholesome waters were among the most deleterious that could be taken, being largely impregnated with mineral substances. There was in them a tendency to the oxidization of organic matter, and hence they acted most injuriously. In the yard-waters the amount of organic matter was often very small, a very small quantity of drainage being sufficient to give a brown colour to a large quantity of water. Water which appeared to be impregnated with a large quantity of organic matter was often not so in reality. When, however, a large quantity of refuse material found its way into pond-water it must be injurious.

Professor Simonds agreed with Professor Voelcker that the dark colour of water did not of itself prove that it was deleterious. There was a great deal of colouring matter in the farm-yard that found its way into the contiguous pond, and it was an established fact that cattle drank such water with impunity. Some cattle even preferred it—he would not say to their benefit—to harder, clearer, and brighter water. Whether or not such water acted injuriously or not to health depended, however, on the amount of organic matters in it. It might contain so small an amount as not to be prejudicial

to the health of an animal, or, on the contrary, so much organic matter and saline substances might be mingled with it as to render it very deleterious.

Lord WALSINGHAM then moved a vote of thanks to Professors Simonds, Buckman, and Voelcker for their able and instructive lectures.

Colonel CHALLONER seconded the motion

The CHAIRMAN, before putting it, said he was sure the council and the members present were much obliged to those gentlemen for the information with which they had favoured them; and when an account of the proceedings was published in the usual organs, it could scarcely fail to direct the attention of the owners and occupiers of land in similar districts to that which had been described—to the question whether, as regarded a great deal of such land, it might not be well if were broken up, not necessarily for a permanency, but for a course of tillage; so that if it were again converted into pasture the present bad grasses might be superseded by grasses of improved quality.

The motion was then agreed to, and the proceedings terminated.

ON THE SCOURING LANDS OF CENTRAL SOMERSET.

By Dr. AUGUSTUS VOELCKER, Royal Agricultural College, Cirencester.

(From the *Bath and West of England Agricultural Journal.*)

(*Concluded from p.* 436.)

A CAREFUL perusal of the preceding analytical results suggests several observations.

1. The proportion of mineral matters is greater in the scouring than in the sound herbage. Thus whilst the hay from peat-land at Meare contained only 7 per cent. of mineral matters in round numbers, the hay from scouring-land in the same locality contained as much as 10 per cent. Every 10 lbs. of such hay, therefore, contained 1 lb. of mineral substances, which is a very large quantity indeed.

2. Not only is the absolute quantity of mineral matter greater in scouring than in sound hay, but the ashes of both likewise differ materially in composition. In the ash of hay from peat-land, it will be seen, a very much larger proportion of silica and much less chloride of potassium occur than in the hay from scouring-land. If the potassium in the chloride is calculated as potash, and this is added to the potash which exists in the ash principally as silicate, the total

quantity of potash in the ash of the hay from peaty land will be found to amount to 26·30 per cent., and that of the hay from scouring-land to 36·33 per cent. Again, the per-centage of chlorine in the chlorides of these two ashes differs greatly; in the one it amounts to 13·42 per cent., and in the other to only 9·32 per cent. We thus find a much larger proportion of potash salts and less silica in scouring hay than in sweet hay from peaty land.

3. The proportion of nitrogenized compounds in sound hay is smaller than that of hay from scouring-land. Thus in the hay from peaty land we have not quite 9 per cent. of these compounds, and in one sample of hay from scouring-land at Meare rather more that 11 per cent., and in the second as much as 14¾ per cent. of nitrogenized compounds.

The preceding analytical results therefore show that the organic portion as well as the mineral part of sound and scouring hay materially differ from each other in composition, and I have no doubt that other differences would have been brought to light had the organic portion of hay been more fully examined. I have confined myself to the determination of nitrogen in the hay, because its proportion in vegetable produce affords an excellent indication of its state of maturity, and a more complete organic analysis should be undertaken with the fresh and not with the dried produce.

Not many years ago a high per-centage of nitrogen in hay, turnips, mangolds, and other kinds of agricultural produce was regarded as a proof of their superior nutritive value; but a thorough investigation which I undertook on account of the frequent discrepancies in the calculated theoretical nutritive value of various articles of food, and the value assigned to them by practical men, has shown me that the higher proportion of nitrogen in one of two samples of hay, turnips, mangolds, &c., by no means indicates a higher feeding-value, but the very reverse. I have been actively engaged for more than three years with an inquiry into the changes which roots undergo in their various stages of growth, and especially when they approach maturity. In connection with this inquiry a great many collateral experiments were instituted, to which reference cannot be made in this place. Some of the results, however, have so direct a relation to the subject of this report, that I cannot refrain from stating some of the principal.

Amongst other particulars I find :—

1. That the proportion of ash and of nitrogen in unripe turnips, mangolds, grass, young shoots of plants, &c., is very much larger than in ripe and sound roots, &c. A large proportion of ash, and especially of nitrogen, indeed, is an excel-

lent indication of the unripe and unwholesome condition of turnips, mangolds, and vegetable produce in general. To mention only a few examples: whilst unripe mangolds, according to the stage in which they are examined, contain as much as $2\frac{1}{2}$ to 3 per cent. of nitrogen in a dry state, when fully ripe they contain only $1\frac{1}{2}$ to $1\frac{3}{4}$ per cent. of nitrogen. In turnips dried at 212° Fahr. I find the proportion of nitrogen in roots at an early stage as high as $3\frac{1}{2}$; examined later in the season, the proportion of nitrogen gradually dwindles down exactly in the measure in which they get more ripe, and reaches a minimum when they are perfectly mature.

2. In quickly-grown rank grass from irrigated meadows I find a larger proportion of nitrogen and mineral matters than in good sweet meadow-grass. I need hardly say that the latter is infinitely superior to the former in nutritive value.

3. In turnip-tops and mangold-leaves the proportion of mineral matters and nitrogen is nearly double that contained in the ripe roots, which, of course, are more nutritious than the tops.

4. In unripe roots, grass, leaves, &c., in which a high per-centage of nitrogen occurs, I find, comparatively speaking, little sugar, and a considerable quantity of various vegetable acids, such as tartaric, oxalic, malic, and tannic acids.

These are some of the principal results which have a direct bearing on the subject under discussion. We thus see that a high per-centage of ash and nitrogen in roots, &c., indicates an immature condition, and is always accompanied by a comparatively small quantity of sugar, and by a large proportion of various vegetable acids. Most of these acids, either in a free state or in their combinations with mineral matters, especially with potash or soda, have a decidedly aperient effect; hence we can account for the scouring effects of unripe mangolds, turnip-tops, mangold-leaves, young unripe clover, Italian rye-grass forced with too much liquid manure, and grass from water-meadows at certain seasons of the year.

The herbage from scouring pastures is unwholesome for the same reason for which unripe mangolds, turnips, and forced grass are injurious to cattle. My investigations show that the hay from such pastures contains more nitrogen and ash than that from sound land; and as more especially a higher per-centage of nitrogen indicates a less mature and less nutritious condition than a lower, there cannot remain much doubt that the immature condition of the herbage is the origin of the complaint in nine cases out of ten.

It is worthy of special notice that quickly-grown and very luxuriant-looking clover and grass invariably contain more nitrogen and ash than clover and grass which are more gra-

dually developed, and, further, that the former invariably scour, whilst the latter are wholesome.

Living in the country, I have had ample opportunity of observing this fact, and also that the grass on water-meadows is never more unwholesome than when it grows most luxuriantly. In this condition grass is rich in nitrogenized compounds, in soluble saline substances, and in organic acids.

At an early stage of growth we find in all vegetable produce a much larger proportion of soluble saline matter, organic acids, and other combinations which have an aperient effect, than at a more advanced stage of growth. In the measure in which plants advance in maturity the soluble salts become insoluble, the organic acids disappear, and are replaced to a great extent by sugar; the compounds of nitrogen and the mineral matters decrease in proportion to the bulk of the whole plant, and other changes which cannot be here described in detail take place in the growing vegetable organism. The great difference in the taste of almost every plant at an early and more advanced period of growth shows that the compositions of ripe and immature plants materially differ from each other. I do not know a single herb which, consumed in quantities in an immature condition, does not act as an aperient; even plants which when quite ripe are good tonics, at an early stage of their growth possess laxative properties.

In many parts of Germany the expressed juice of various herbs, such as dandelion, millefoil, water-cresses, or common meadow-grass, is considered a favorite spring medicine for purifying the blood. It is, however, only in the spring, when vegetation makes, as it were, a fresh and rapid start, that these herb-juices possess the desired aperient effect, and it matters little what kind of herb is employed in their preparation.

Several other facts well known to practical men confirm my analytical investigation of the herbage of sound and scouring pastures, and receive an intelligible explanation by the latter. It is, for instance, a well-known fact that the application of manures to scouring-land increases the evil in proportion to the forcing effects of the fertilizers employed and the consequent luxuriant growth of the young herbage.

In scouring pastures there is abundance of plant-food, and hence in the drier summer months the herbage on such pastures grows with great luxuriance. The direct use of manure increases still further this luxuriant growth of the herbage, but at the same time retards its getting mature soon enough before it has to be made into hay. Hence the use of manures generally aggravates the scouring properties of the herbage. An excess of manure under all circumstances retards the ripening process, and tends to produce less wholesome and

less nutritious roots, green and fodder crops; whilst a scanty supply of manure on naturally poor soils tends to push on plants to early maturity. It is upon this principle that gardeners act when they require to force flowers into early bloom.

Again, the fact that the complaint ceases almost entirely after the first November frost finds a ready explanation by my views on the character of the herbage from scouring pastures. Like the unripe wood of our fruit-trees, the unripe young clover-leaves and grass-shoots in our meadows are killed much more readily or changed in composition than the older and more matured portions of the herbage. But as the immature young leaves and grass-shoots only have medicinal effects, the pasture becomes either altogether sweet after the first autumnal frost, or the evil is seen in a much more mitigated form on land which scours during the summer months.

It now remains for me to point out how it is that scouring land frequently does not bring the herbage to a sufficient degree of maturity.

In the first place I would observe that lias-clays contain an excess of mineral food, and, being retentive even after draining, they also often contain a large quantity of water. The excess of water and coldness of the soil retard the early development of the herbage. The upland position of all hill-pastures, on which the evil generally preponderates, of course is also unfavorable to an early growth of the herbage. But, more than this, the peculiar tenacious character of the lias-clay subsoils on scouring land, the great depth of these clay-beds, and their near approach to the surface soil, tend to retard vegetation, and to make it very gradual during the colder and wetter months of the year. In many cases under-drainage, besides taking off the surface water, produces little alteration in the condition of the surface soil, for the simple reason that it is too thin, and the clay subsoil bed too tenacious and too deep to be penetrated by the ameliorating influence of the atmosphere.

During many months of the year such thin surface soils in hilly districts, after they have been drained, remain as cold and almost as wet as before. When the temperature of the air becomes more genial to vegetation, and the weather much drier than during the other and greater part of the year, the clay-land on the Polden Hills becomes sufficiently dry and warm to allow vegetation to make a start; and the abundance of mineral food in the land then rapidly pushes forward the herbage, and causes it to grow with much luxuriance, especially if the summer temperature is high, and just sufficient dew or gentle rain falls to keep the clay from cracking. On the hills, and on naturally cold, stiff land, this period of rapid

growth takes places much later in the season than in less retentive and warmer soils. In districts where scouring prevails, the haymaking season is generally later than in other localities; but, although delayed, the grass-crop on the worst scouring meadows in most seasons does not quite sufficiently mature, and in consequence of the immature and green condition in which the grass is cut down, the hay scours.

Pastures which do not scour, though situated in the same district where scouring land abounds, either have a more porous subsoil or the blue lias-clay lies at a depth not reached by the roots of plants. On such land the herbage has a chance to make a start earlier in the season, and to grow more regularly and to get more readily matured than on scouring land.

Lias-clay land thus often scours, not because it is too poor or because it is too wet, or because it contains something or other inimical to vegetation—but because it is very abundant in plant-food; and, from the peculiar position of the subsoil on scouring land, its depth and impervious, highly tenacious character cause a too luxuriant growth of the herbage during the warmer summer months. Consumed in this condition the herbage is immature and scours, even when made into hay.

But should the summer be long and warm, and a farmer have the discretion to delay haymaking, he will find that scouring land will produce, in his case, good wholesome hay. In wet summers, and during the rainy part of the year, the evil ceases either altogether, or is much less aggravated than during the dry and warm summer months. This is perfectly intelligible, for it is during the warm and dry summer months that young immature clover-leaves and grass-shoots are most abundantly developed on scouring land. For the same reason the grass on water-meadows scours most during the summer months, and not during the winter and early part of the spring.

The preceding analytical proofs and agricultural facts warrant the conclusions that will be found in this paper. For the convenience of the readers the leading conclusions may here be briefly recapitulated:

1. Lias-clay soils contain nothing injurious to vegetation.
2. These clays contain abundance of mineral plant-food.
3. The waters in the lias formation are very hard; many possess medicinal properties, and, no doubt, scour cattle that drink them.
4. In some exceptional instances land scours on account of being inefficiently drained.
5. In most cases, however, the evil can be traced directly to the immature condition in which the herbage is consumed by cattle on scouring land, or made into hay.
6. This immature condition of the herbage is most notable

during the drier summer months, when the young herbage grows very luxuriantly.

7. The immature condition in which the herbage on scouring land is usually consumed, is principally caused by the peculiar character and relation of the subsoil to the surface-soil of scouring pastures.

8. No positive evidence exists, showing that the complaint is due to a particular species of herb.

A clear recognition of the causes which produce certain evils generally leads to some cure, or to means which are calculated to mitigate what cannot be cured. This report would not be complete if no allusion were made to the means at our command, either to cure scouring land or to mitigate the complaint to which cattle are subject on certain pastures. But as the report has become already more bulky than I intended to make it, the briefest allusions to this matter must suffice. I would therefore observe—

1. It is highly advisable to cut off the supply of hard lias-springs and to provide cattle with soft drinking water.

2. Rain-water tanks, for the supply of soft water, should be constructed in localities where cattle are obliged to drink hard waters that rise in the lias-clay.

3. In some, though I fear exceptional cases, more efficient drainage will mitigate the evil.

4. It is desirable to keep cattle from scouring pastures in those months of the year when the young herbage appears very luxuriant.

5. The haymaking season on scouring pastures should be delayed as long as is possible in practice, in order to give the herbage a better chance of acquiring maturity.

6. There are, however, many scouring pastures on which neither drainage, nor any other available means will have any material effect in bringing the herbage to an earlier and better state of maturity; and as the unripe condition of the herbage is by far the most common proximate cause of the evil, the best thing perhaps that can be done with such pastures is to plough them up.

[NOTE.—I am of opinion, from what I have tried and observed on the "tart" lands at Pylle, where, I regret, the Professor has not made an inspection, that the plough is the true remedy, and all "tart" lands should be converted into arable lands. The clover-hay, the pasture on the clover-ley, and the roots fed by sheep on such land have no scouring properties; and, after a fair trial of some bad scouring lands, I have advised my tenant to break up and cultivate several scouring fields, which will, as I believe, be profitable instead of noxious land.—PORTMAN.]

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Journal des Vétérinaires du Midi, February, 1862.

COMPARATIVE OBSERVATIONS ON THE CHARACTER AND ORGANIZATION OF THE *DACHMIUS TRIGONOCEPHALUS*, DUJARDIN.—A WORM FOUND IN THE VESSELS AND HEART OF THE DOG.

By M. C. Baillet, Professor at the Imperial Veterinary School of Toulouse.

In a note, published in 1854, on an observation by M. Serres, the author says, we classed with the *Dachmius trigonocephalus*, Duj., nematoid worms found by our colleague in the pulmonary artery, the right ventricle, and the right auricle of the heart of a dog. We have since had opportunities of studying *de novo* and more completely these parasites, and of comparing them with the *Dachmius trigonocephalus* of the intestines, and it was easy to perceive that they were far from being of the same species as the latter. But if we have been able to separate them accurately from the nematoids with which we had at first confounded them, on the authority of a passage in the excellent treatise of M. Dujardin, it has not been so readily done when we have tried to class them with one of the species which have been designated till now as inhabiting the different organs of the dog. We have been, therefore, induced to consider them as constituting a species which has not yet been described, or, at least, not distinctly, by the authors whom we have consulted. For this reason we propose to study in this note, comparatively, the *Dachmius trigonocephalus* with the worm that is found in the pulmonary vessels of the dog, and examine them successively in their external conformation, their digestive apparatus, and their organs of reproduction.

External conformation—The *Dachmius trigonocephalus* has a thin, white, cylindrical body, slightly tapering at each end, with a little fulness in the middle. The head, which is of the size of ·08mm. to ·10mm., is a little on one side, obliquely truncated, and provided with three transparent lobes, which are in reality only visible when examined in front. The integument is marked by transverse striæ, which are ·003mm. to ·004mm. apart. The worm of the vessels of the heart has

a lank, slender, cylindrical body, pointed at the extremities, often marked throughout its whole length by a reddish, spiral line, frequently interrupted, marked under the skin by the digestive tube. The head measures from ·08mm. to ·10mm., and is straight; generally provided with two transparent membranous folds (which, perhaps, are produced by endosmosis, from the worm having been left in water a few seconds before examination), and which, uniting anteriorly, form a sort of narrow border more or less deeply margined. The integument is not striated transversely, but is marked by some longitudinal lines far apart.

Digestive apparatus.—The mouth of the *Dachmius trigonocephalus* is somewhat lateral, orbicular, wide open, and furnished with a prominent border. In continuation of the mouth there is a pharyngeal capsule in the form of a cupola, with widened resisting parietes. The œsophagus, at first cylindrical, swells out towards its posterior half. The intestine, which is a continuation of the œsophagus, is at its origin not so large as the latter, is slightly bosselated, and is in a straight line from the mouth to the anus; before reaching the latter it becomes a little contracted. The anus is placed a little anterior to the end of the tail. To the digestive apparatus are annexed two organs of secretion, which seem to be analogous to salivary glands. These glands are situated where the organs of generation (the testicles or ovaries) describe their curves anteriorly; one of them is placed a little more backward; both are the shape of a small, elongated vesicle, bulging out in the middle, terminating posteriorly in a *cul de sac,* obtuse and canoïd in form, becoming insensibly more slender anteriorly, until it forms a very narrow tube, which terminates with an opening in the pharyngeal cavity. Each of these glands has in its centre a sort of opaque nucleus. The mouth of the nematoid of the vessels and of the heart is very small, round, naked, terminal, and unprovided with a pharyngeal capsule. The œsophagus is short, and hardly any wider at its termination than at its origin. The intestine is fuller than the œsophagus; its course is traced under the integument by a reddish line, as before stated; it is longer than the body, very sinuous, as if twisted with the tube of the organs of generation. The anus in the male is a little anterior to the membranous ala, and in the female a little anterior to the point of the tail; finally, up to the present time, no trace of a salivary apparatus has been discovered.

The organs of generation in the male.—The male *Dachmius trigonocephalus* is from 6mm. to 8mm. in length. Its tail terminates by a membranous ala or wing, which is divided into three lobes;

the two lateral are round and longer than the middle, which has a longitudinal ridge in the centre; this bifurcates, giving off two branches, which also bifurcate. From the upper part of this central ridge arises on each side a curved ridge, which goes to the corresponding lobe, thus forming a semicircle with the opposite ridge. Independent of this, the lateral lobes are supported by four ridges, confluent to their base, but spreading as they separate. These three lobes constitute a membranous sack, which is transparent in every part, and on which the ridges do not exist. The same as in the majority of the nematoids, they have but one testicle, which is a very simple organ, being formed by a tube which takes its origin at about two thirds of the length of the body, and a little behind the head. At the beginning it is very small, doubles twice on itself, then ascends to the anterior third of the body, where it again doubles, and forms a convexity; afterwards descending to the origin of the tail. A little beyond this convexity it insensibly increases in size, until it acquires three or four times its ordinary diameter; thus increased, this testicular tube reaches the place where it started from, when it suddenly contracts and forms a narrow, short canal, which terminates in a large tube with thick parietes, formed by transverse, oblique fibres. This tube becomes also thinner as it progresses towards the extremity of the tail, where it is provided on its sides with two spiculæ, which have the power of retracting within the body; they are very thin and slender, beginning each by a sort of hollow or cavity; they are from ·60 mm. to ·70 mm. in length. In the worms of the vessels and the heart of the dog, the males are from 14 mm. to 15 mm. long; they have the tail reflected and obtuse, terminated by a membranous, short, obtuse, transparent wing, which has two lobes, each of which is supported by four ridges or ribs; the external one is bifid, the second simple, the third bifid, and the last short and simple. There is also only one testicle; this organ, which originates a little below the termination of the œsophagus, is at first a very slender tube, which, however, rapidly swells out and descends, forming many sinuosities the whole length of the body, twisting itself in its course round the intestinal tube. It terminates posteriorly by two spiculæ, which, at their origin, and when retracted, are close to the sides. The two spiculæ are very slender, equal in size, and about ·36 mm. to ·40 mm. in length.

The organs of generation in the female.—The body of the female *Dachmius trigonocephalus* is in length from 9 mm. to 13 mm., a little fuller, and the tail terminates more suddenly than that of the male, in a conic point. It is provided with two ovaries, which are tubular, and arise about the

anterior third of the length of the body, they are very slender at their origin, and gradually swell out until they acquire the diameter which they preserve throughout. One of these ovarian tubes directs its course, at first forward, then making a curve a little above the part where the œsophagus terminates, continues its course, making many sinuosities, until within a little distance from the end of the tail. There it makes another curve, and remounts to the anterior part, where it makes a third curve, which is the most anterior of all. After this last curve it terminates in a long pouch, filled with eggs, and which might be considered as a peculiar uterus, that gives rise to a slender, tubular, oviduct, terminating in a sort of vestibule, into which the vulva opens, and on the opposite side of which the other oviduct also terminates. The other ovary directs its course backwards, doubles once on itself afterwards, continues in the same backward direction, forms at a short distance from the tail a turn, after which it takes an anterior direction, until it arrives opposite the spot where the first ovaria turn about, when it also is reflected and takes again a backward course, until it gets within a short distance from the tail, where it makes a last turn, and finally terminates in a similar uterus to the one which has already been described. From this uterus emanates a peculiar oviduct which goes to meet the other in the common genital vestibule. The vulva which opens in this vestibule is situated from 6 to 8 mm. from the mouth, and from 3 to 4 mm. from the end of the tail. The eggs are elliptic, and covered with a transparent envelope, their greatest diameter is from ·074mm. to ·078mm., and their smallest from ·048 mm. to ·054 mm. The females of the worm of the blood-vessels and of the heart are from 11 to 21 millimètres in length. The tail is less distorted than that of the male, and terminates in a somewhat obtuse point. They have two ovaries, which run parallel with one another during the whole of their course; they take their origin a little below the termination of the œsophagus, and descend, twisting in divers ways round the intestine, until they reach to within a short distance from the point of the tail. Towards the posterior third of their length they decrease to a slender tube, which soon opens into a much larger tube. These two larger tubes converge, and confound themselves in a common uterus of moderate size terminating by a short, narrow oviduct. This latter opens into the vulva, which is situated ·30 mm. to ·32 mm. from the end of the tail. The eggs are elongated, somewhat swelled out in the middle, obtuse at each end, and are provided with a very transparent envelope; their length is from ·04 mm. to ·05 mm. The Dachmius, the

organization of which has just been described, is evidently the hematoid, which M. Dujardin has described in his 'Histoire Naturelle des Helminthes,' p. 277. But according to the learned professor of Rennes, whose recent loss to science is deeply to be regretted, it is doubtful whether this is the parasite, which Rudolphi has named *Strongylus trigonocephalus*. Rudolphi attributes to his Strongylus a length of from 13 to 27 millimètres; and moreover, he assigns the situation of the vulva as only a short distance from the end of the tail. Now these characters do not agree with the *Dachmius trigonocephalus*, which is only from 6 to 13 millimètres in length, and the vulva of which opens at from 3 to 5 millimètres from the caudal extremity. Neither do we believe that the difference between Dujardin and Rudolphi results from the latter having confounded the *Spiroptera sanguinolenta* with the *Dachmius trigonocephalus*. The former is from 40 to 80 millmètres in length, and the vulva of which is from 2 to 3 millimètres from the mouth. It appears probable that Rudolphi had another parasite in view, in his description, than the one afterwards described by Dujardin; and this might have been the helminthia, which has been found in the pulmonary artery and the right cavities of the heart. By his dimension, the worm found in the blood-vessels and the heart of the dog does really resemble that described by Rudolphi; and moreover, it has, like the latter, the vulva placed close to the end of the tail. We have, therefore, provisionally designated it as the *Strongylus trigonocephalus*, Rudolphi, not Dujardin. There is, however, one circumstance which makes us hesitate in considering it as identical with the one described by that celebrated helminthologist. Rudolphi states that he found his Strongylus in the intestines of the dog, while that collected at Toulouse has been found four times since 1824, either in the heart or the pulmonary vessels, and never in the intestines of the dog, although, from the great number of dogs which have been sacrificed for divers experiments, or have died in the infirmary of the school, there have been ample opportunities for researches, as they have all been subjected to post-mortem examinations for that purpose. But we must add, that the different habitat is not a sufficient reason for considering them as of different species; for many zoologists, have considered as constituting only one species, the sclerostoinæ of the intestines of the horse, and the parasite found in aneurism of some of the arteries in the solipedes. It is therefore not impossible that the worm which we have described may inhabit the vessels and the heart of the dog, and, at the same time the intestines of the same animal. Whatever the

worm of the vessels and the heart of the dog may be, it cannot be the *Dachmius trigonocephalus* of Dujardin; it remains, therefore, to determine with which species it is to be classed. At the time of Rudolphi the worm which has occupied our attention would evidently have been classed with the Strongylus of Müller; for the male possesses in a high degree the caudal pouch supported by two costæ or ribs which is considered by this celebrated naturalist as the essential characteristic of this genus. But for a number of years the genus Strongylus has become dismembered. Dujardin first, and afterwards Diesing, have formed out of it the Sclerostoma, Stenurus, Pseudalius, Dachmius, Eustrongylus, and the Strongylus, unprovided with buccal armour, and œsophageal capsule; the worm in question cannot belong to either the Dachmius, Sclerostoma, or the Stenurus. The tail not being bifid, its spiculæ, which are not elongated, and the vulva, which is not prominent, considerably separates it from the genus Pseudalius. Finally, it cannot be ranged with the genus Eustrongylus; for MM. Blanchard and Diesing have shown that in the *Eustrongylus gigas*, which is taken as the type of this genus, the caudal pouch in the male is not provided with costæ, and there is but one spicula; in the female there is but one ovary, and the vulva is situated at a short distance from the mouth. But by its thread-like body, attenuated at each end; by its small naked mouth; by its caudal pouch, obliquely truncated, and provided by transparent costæ or ribs; as likewise by its two slender spiculæ, this nematoid evidently belongs to the genus Strongylus, of which it constitutes a remarkable species. We must, however, add finally, that by the disposition of the organs of generation, it has some affinity with the *Sclerostoma hypostomum*, Dujardin, and the *Sclerostoma tetracanthum*, Diesing, and also with the *Sclerostoma dentatum*, Diesing. All these have two elongated ovaries terminating in the uterus, from which emanates a common oviduct opening in the vulva; which latter is situated a short distance from the tail. They likewise have two long, slender spiculæ, and a caudal pouch with multiple rays and a single testicle, which is more or less retracted within the body.

The salivary apparatus might not be considered so rare in the nematoids as has been hitherto believed. We have ascertained its existence in all the Sclerotomians of the domestic mammiferous animals which have come under our notice, that is to say, the *Sclerostoma equinum*, Duj., the *S. tetracanthum*, Dies., the *S. hypostomum*, Duj.; the *S. dentatum*, Dies., and in the *Dachmius trigonocephalus*, Duj. Moreover, it has

been found likewise in the *Strongylus filaria*, Rud., and the *Oxyuris curvula*, Rud. In the majority of the above-cited parasitic worms the salivary apparatus is composed of two glands, in the shape of a vesicle raised from the effect of a blister; they are situated a little below the termination of the œsophagus; on each side there emanates a long, slender canal which ascends along the intestine and the œsophagus, and terminates with an opening into the mouth.

Nevertheless, in the *Sclerostoma equinum*, Duj., the salivary apparatus, studied by Blanchard, differs materially from the general disposition which we have given; they in fact are composed of two long vesicles which extend beyond the termination of the œsophagus and which are slightly mamillated in parts and terminate in the posterior portion of the buccal cavity undiminished in diameter, and consequently without forming an excretory canal. Equally with M. Blanchard we have found that the salivary apparatus varies very much in the different individuals which seemed to have attained an equal degree of development; in fact, sometimes we find two vesicles distended and turgescent throughout their whole length; at other times, on the contrary, they appear as if atrophied, and not the slightest trace could be found of their existence; while under other circumstances every possible intermediate between the two extremes was discovered. In the *Sclerostoma tetracanthum*, Dies., the two salivary glands situated just a little below the inferior extremity of the œsophagus are placed on the side of the intestine, both nearly on the same level. They are in the shape of two short ovoid vesicles, slightly distended in their centre, terminating posteriorly into a short, irregular, obtuse *cul de sac*. Each gland furnishes an excretory canal, very slender, and closely united in its course with the intestine and the œsophagus, terminating in the pharyngeal capsule with which this parasite is provided. The salivary vesicles of the *Sclerostoma hypostomum*, Duj., are likewise situated on the sides of the intestine, at some distance from the termination of the œsophagus. They are not both at the same height, one being a little lower than the other; the origin of its excretory canal corresponds with the *cul-de-sac* of the former. Both are elongated, piriform, and distended at the base, diminishing insensibly into a slender tube, which opens at the bottom of the pharyngeal capsule. The salivary glands in the *Sclerostoma dentatum*, Dies., are very similar to those of the *Sclerostoma tetracanthum*, Dies., the only difference being that both are placed on the same level, and on the side of the intestine, the salivary canal having the same disposition as the last described. As may

be perceived by the descriptions which we have given above, the salivary glands of the *Dachmius trigonocephalus*, Duj., and those of the *Sclerostoma hypostomum*, Duj., are not situated on same level. They are remarkable for their elongated form, their conical *cul de sac* which terminates posteriorly, and more particularly by the nucleus which is perceived in their centre. Their excretory canals offer nothing worthy of notice. The salivary glands of the *Strongylus filaria*, Rud., belong to the same type as those of the Sclerostoma. They are spindle-shaped, elongated, and diminish towards their *cul de sac*, attenuated anteriorly into a thin canal which terminates in the mouth. They are placed a little below the inferior part of the œsophagus. It is not the same with the *Oxyuris curvula*. In the nematoid the salivary glands are in the form of small round vesicles, nearly globular, they are placed towards the middle of the œsophagus, and form a small, somewhat sinuous canal, which opens at the bottom of the mouth.

This paper is accompanied by woodcuts representing the salivary apparatus in the various species.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, HELD JULY 9, 1862.

PRESENT: — The President; Messrs. Braby, Cartledge, Ernes, Ellis, Field, Harpley, Lawson, Moon, Wilkinson, Withers, Assistant-Professor Varnell, and the Secretary.

The President, PROFESSOR SIMONDS, in the Chair.

The minutes of the preceding meeting were read and confirmed.

Communications were read from Professor Dick; Messrs. J. S. Gamgee, and T. W. Gowing, accepting the office of Vice-Presidents, to which they had been elected at the former meeting of the Council.

The reappointment of Committees for the year was then proceeded with, viz.:

The Finance Committee to consist of Messrs. Braby, Ernes, Harpley, Moon, Simonds, and Wilkinson.

The House Committee to consist of Messrs. Ernes, Field, Spooner, and Withers.

The Registration Committee to consist of Messrs. Ernes, Harpley, Simonds, and Wilkinson.

The Inquiry Committee to consist of Messrs. Ernes, Gowing, Harpley, Jex, Mavor, Moon, and Varnell.

The report of the Finance Committee and quarterly balance-sheet of the Treasurer's account was presented. It appeared that the balance in hands of the Treasurer was £551 3*s.* 6*d.*

The report was adopted.

The Registrar's report, announced that thirty-four members had been admitted from the Royal Veterinary College, London; and thirty-one members from the Veterinary Colleges, Edinburgh; also, that nine deaths had occurred during the quarter, viz.:—Mr. W. Smith, Epsom, Surrey; Mr. J. Jones, late a member of the Council, London; Mr. Adam Ross, Inverness; Mr. James Howie, New Deer, Aberdeen; Mr. Robert Pooley, New York, U. S; Mr. William Dyer, Croydon, Surrey; Mr. P. O. Polding, Bury, Lancashire; Mr. William Cox, Ashbourne, Derby; and Mr. William Wright, Burnham, Norfolk.

It was moved by *Mr. Ernes*, and seconded by *Mr. Lawson*—

"That, as numerous alterations have taken place with regard to the Register, and only a few copies remain on hand, a new Register be prepared by the Committee, with an *addendum* containing a county list of practising veterinary surgeons." Carried.

The President informed the Council that an Act for giving greater facilities for summoning persons to serve on juries, was pending in the House of Lords, and that he had had an interview with Lord Portman on the subject of extending to the members of the Royal College of Veterinary Surgeons the same privilege of exemption as was now enjoyed by physicians and surgeons, and he had received an assurance from his lordship that he would do all within his power to further the wish of the profession.

Resolved:

"That a petition to the House of Lords be forthwith prepared, praying their Lordships to amend the said bill, so as to include the members of the Royal College of Veterinary Surgeons in the list of persons exempted."

The following petition was thereupon prepared, and received the signature of the President on behalf of the Council:

To the Right Honorable the Lords Spiritual and Temporal in Parliament assembled.

SHOWETH

That your petitioners observe that a bill is pending in your Lordships' House, entituled, "An Act to give greater facilities

for summoning persons to serve on Juries, and for other purposes relating thereto."

That by the existing law "all members and licentiates of the Royal College of Physicians in London, all members of the Royal College of Surgeons in London, Edinburgh, and Dublin, and apothecaries certificated by the Court of Examiners of the Apothecaries' Company, if actually practising as physicians, surgeons, or apothecaries, respectively," are exempt from serving on juries.

That the veterinary profession was incorporated by Royal charter in the year One thousand eight hundred and forty-four, under the name and title of "The Royal College of Veterinary Surgeons."

That by the said charter of incorporation it was enacted that all members of the said body, corporate and politic, "should be individually known and distinguished by the name and title of veterinary surgeons."

That as members of the said body corporate and politic, they have committed to their professional care the health of domesticated animals in general, and as such are to be considered the conservators of an immense proportion of the wealth of the United Kingdom.

That their being compelled to serve on juries often places the lives of valuable animals committed to their care in imminent danger, and not unfrequently leads to serious losses.

That they beg leave most respectfully to submit that the various reasons which have been given in favour of the exemption of the members of the hereinbefore-named professions can with equal force be urged as an appeal affecting the important interests, not only of the members of the said Royal College of Veterinary Surgeons, but of all those in whose behalf their professional services are exercised.

Your petitioners therefore humbly pray that your Right Honorable House will be pleased to amend the said bill, by including in the list of exemptions from serving on juries the "Members of the Royal College of Veterinary Surgeons."

And your petitioners will ever pray.

JAMES B. SIMONDS,
President,
On behalf of the Council of the Royal College of Veterinary Surgeons.

Cheques were drawn for the current expenses.

The "Testimonial Committee," appointed to make arrangements for the presentation of a testimonial from the Council

to E. Braby, Esq., placed on the table a handsome silver tea service, which had been selected agreeably to that gentleman's wishes, bearing the following inscription:

PRESENTED TO
E. BRABY, ESQ., M.R.C.V.S.,
BY THE COUNCIL OF THE ROYAL COLLEGE OF VETERINARY SURGEONS, IN ACKNOWLEDGEMENT OF THE GRATUITOUS AND VALUABLE SERVICES RENDERED BY HIM AS THEIR HONORARY SECRETARY.
July 9th, 1862.

The presentation was made by the President in the name of the Council, in a few suitable remarks.

Mr. Braby, in a feeling manner, expressed the willingness with which he had undertaken the duty of Secretary in a case of great emergency, and begged to thank the Council for the handsome testimonial with which they had so kindly presented him.

Parliamentary Intelligence.

JURIES BILL.

By the subjoined report, the members of the profession will observe with much regret, that the Lords' amendments to the "Juries Bill" which had given to them, in common with pharmaceutical chemists, an exemption from the serving on Juries, have been negatived in the Commons, *simply by the casting vote of the Speaker*. This decision, however, should only encourage us to persevere until the desired end is attained. We are, at least, beginning to know our strength; and this defeat, which, so closely approximates a victory, should only stimulate us to further exertions.

Juries Bill.

The House having gone into the consideration of the Lords' amendments on this bill,

Sir G. Grey said he did not think that either veterinary surgeons or pharmaceutical chemists properly came within the general principle of exemption which applied to surgeons or physicians, who might be called upon at any moment to attend a patient. Besides, the pharmaceutical chemists were bound to keep an assistant qualified to make up medicines. If the exemption in question were granted to pharmaceutical

chemists, ordinary chemists and druggists, who numbered over 40,000, would be coming next year to put in their claims. The exemption of those classes would only throw an additional burden on other members of the community (hear hear), and he should therefore move that the House do disagree with the Lords' amendment.

Sir H. Stracey regretted that the amendment should be objected to. The pharmaceutical chemists were an educated body. He hoped the amendment would be allowed to pass. (Hear.)

Mr. Hodgson said, the pharmaceutical chemists amounted to only some 2,000 and odd, and it was very desirable that they should be exempted. (Hear.)

Mr. Collins objected to their exemption, on the ground that the burden, if taken off the pharmaceutical chemists, would be thrown upon other persons. (Hear, hear.)

Mr. S. Booth said it had always been the policy of the House to encourage an educated class of chemists, and he hoped therefore the Lords' amendment would be agreed to.

Mr. Newdegate thought that the claims of the veterinary surgeons were treated very lightly. They were men of high training, and well-deserving of consideration.

Mr. Potts supported the Lords' amendment.

The House then divided on the motion that the House do disagree with the Lords' said amendment, and the numbers were—

Ayes	53
Noes	53

The announcement of a "tie" was received with cheers and laughter.

In giving the casting vote,

The Speaker said that the House having sent this bill up to the House of Lords in a certain shape, an amendment had been inserted by the Lords, upon which the House had just voted in equal numbers. He should, therefore, himself vote with the "Ayes," so as to give effect to what appeared to be the intentions of the House. (Hear, hear.)

The Lords' amendment was therefore disagreed to.

THE

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Communications and Cases.

THE PRESENCE OF MORPHIA PREVENTS THE DEVELOPMENT OF THE COLOUR-TESTS OF STRYCHNIA.

Dr. J. Reese, of Philadelphia, has by experiment shown that if morphia be present in the stomach in association with strychnia, the usual colour-tests fail to demonstrate the presence of the last-named agent.

Three half-grown cats were experimented on by him. To the first he gave half a grain of strychnia. In eleven minutes it died in violent convulsions, and the poison was easily detected in the contents of the stomach on the following day. To the second, a quarter of a grain of strychnia, and the same quantity of morphia, were administered. The animal became much convulsed, and died in six minutes. Here it would appear that the toxication of strychnia was increased, although it and morphia may be said to produce opposite physiological influence. Scarcely any recognisable evidence of the presence of strychnia could be afforded on analysis of the stomach's contents. To the third animal the one twentieth of a grain of strychnia, and the one tenth of a grain of morphia were given. Convulsions took place in about fifteen minutes, and death in half an hour. The stomach was examined by Staas' process, as in the other cases, but with a total failure to detect the poison by the colour-tests, although the bitterness of the extract, and its decided action in producing tetanic convulsions in a number of frogs, clearly established its presence.

Mr. Horsley, writing on this important subject in the *Chemical News,* says:

"It is very true, as stated by Dr. Reese, that morphia in excess has

the power of preventing the effect of chemicals upon strychnia, as ordinarily practised; but the difficulty of detecting it is more apparent than real, all that is necessary being (if the two alkaloids have really been extracted from a dead body) to adopt the method of precipitation of strychnia by the addition to the concentrated aqueous or neutral solution of a few grains of neutral chromate of potash, as suggested by me at the British Association for 1856, aiding the formation of the golden-coloured crystalline precipitate by brisk agitation for a minute or so with a glass rod, then carefully decanting the supernatant liquor containing the morphia (the chromate of which is longer forming); or it may be passed through a very small filter, and the chromic salt of strychnia collected for experiment with strong sulphuric acid, the merest particle of the salt being sufficient. Under the microscope, the crystals of chromate of strychnia are in the form of little golden-coloured stars; but the corresponding salt of morphia is that of little round granules, with a dark ring on the outside. As a matter of course, these latter, when touched with sulphuric acid, turn green, and so, when in excess, have the effect of masking the reaction of strychnia, which remains passive."

Dr. R. P. Thomas, Professor of Materia Medica in the Philadelphia School of Pharmacy, also states, that—

"A question of great moment has recently arisen, as to the possibility of detecting strychnia at all, if the poison should be associated with an equal, or a greater quantity of morphia, or a salt of morphia in the presence of an organic fluid.

"The property, referred to morphia when combined with organic matter, of preventing the detection of strychnia by colour-tests, will, if confirmed, afford a satisfactory explanation of the difficulty experienced by Drs. A. S. Taylor, and G. Owen Rees, in their examination of the viscera of J. P. Cook, as elicited on the celebrated trial of William Palmer for his murder, in May, 1856. They could not detect a trace of strychnia, notwithstanding the symptoms antecedent to Cook's decease pointed unequivocally to this alkaloid as the fatal agent. If not decomposed, it must have been masked by the presence of morphia, as Mr. Bamford, the attending physician, administered half a grain of this narcotic each night for three successive nights previous to his decease. The circumstances of this trial, and the experiments, described in the papers referred to, furnish an imperative reason for a further investigation of the subject; as the suicide or murderer can destroy all traces of his work, by simply combining an excess of morphia with a poisonous dose of strychnia. The former will not delay the fatal action of the latter, but, on the contrary, will rather aid it.

"With the view of determining the important question, whether strychnia is actually decomposed when treated with test-agents in the presence of morphia, or whether it is merely masked by such presence, I have performed more than a hundred experiments, of which an account of a few of the most valuable and satisfactory is now submitted. Premising that, in the examination of minute portions of strychnia, success or failure depends entirely upon the care given to the details. In all of my experiments I employed crystals of the pure alkaloids and of their salts.

"The 'colour-tests' referred to in this paper, are those furnished by bichromate of potassa, or by the ferricyanuret of potassium (red prussiate of potassa), when added to a portion of strychnia previously dissolved in a drop of strong sulphuric acid. The discrepancies in the

results of the published experiments of different observers depend, I think, in a great measure, on their diverse modes of procedure, and therefore I feel justified in giving a precise account of—

"*The Mode of Testing.*—In every instance the material to be tested was employed in the solid form, such as the pure alkaloids or their salts. If it existed in solution, it was reduced to a solid consistence by evaporation in a test capsule, spontaneously, or by a very gentle heat. Having thus procured a solid substance, a small portion of it was placed upon a white plate, a drop of strong pure sulphuric acid was added, and trituration was carefully made with a glass rod until the substance was dissolved. Then a small quantity of powdered bichromate of potassa, or of powdered ferricyanuret of potassium, was deposited on the plate, near the acid mixture but not touching it, and to the powder a minute drop of water was added—just enough to partly dissolve it—and then, with a pointed glass rod, a little stream was drawn from each of the solutions in such a direction as to cross each other. Immediately at the point of intersection the play of test-colours was beautifully manifested. When the bichromate was employed, the sequence of colours was blue or violet, instantly changing to purple, then gradually becoming red, and finally greenish-yellow. When the ferricyanuret was used, the colour was a rich bluish-purple, changing rapidly to a light rose-red. It is important to proportion the sulphuric acid to the amount of alkaloid, avoiding an excess beyond what is necessary to its perfect solution; and, therefore, it is better to take the acid out of the bottle by a pointed glass rod, rather than to drop it from the lip."

To this follow the experiments, which it is not necessary for us to extract.

Mr. J. E. D. Rodgers asserts that, as morphia is insoluble in benzol, and strychnine very soluble in that menstruum, it is consequently only necessary, where there is reason to suspect the presence of morphia, that the operator substitute benzol for ether or chloroform, and after charring any foreign organic matter by sulphuric acid, he will obtain a trustworthy and satisfactory result.

Mr. Letheby, in a communication addressed to the editor of the journal whence the above is extracted, says:

"In the course of the last year or two a number of essays have been written on the influence of certain substances either in simulating or preventing the action of the nascent oxygen test for strychnia. Among the latter, morphia, tartar-emetic, common salt, sugar and gum have been spoken of as serious impediments to the colour-test. In truth, however, the only importance of those essays is the warning which they furnish to the unpractised operator of the dangers which he will incur in a bungling manipulation. To the practical toxicologist they are of no value except as indications of what mischief may be done to both science and justice by the meddlesome interference of an unskilful hand. The extraction of strychnia from organic mixtures ought to give the alkaloid in a sufficiently pure state to negative the possibility of the fallacies or hindrances above mentioned. Most, indeed, of the so-called impediments to the action of the colour-tests are either soluble in ether and chloroform, which is the solvent used for the alkaloid, or they are so slightly soluble as to give but little trouble in the subsequent part of the analysis; and when, as in the case of sugar, common salt, and

morphia, they are dissolved to a slight extent, and are left with the strychnia in the etherial residue, it is easy to destroy them without touching the stability of the poison. A drop or two of concentrated sulphuric acid put upon the residue and exposed in a dry, warm place for about an hour, will completely destroy all impurity which is likely to be present with the alkaloid; and then the neutralisation of the acid with potash, and a second treatment with ether, will give the strychnia sufficiently pure for detection by most of the colour-tests. I say most of the colour-tests, for my experience has led me to abandon the red prussiate of potash and bichromate of potash as very uncertain agents in comparison with peroxide of manganese, peroxide of lead, or the galvanic battery. In testing for strychnia, therefore, only one precaution is necessary to guard against failure from fallacy or impediment, and that is the putting of a little concentrated sulphuric acid upon the alkaloid, and the letting it stand for a short time before the introduction of the nascent oxygen agent. By adopting this precaution the fallacy at once shows itself by the coloration of the acid without the peroxide, and the impediment is also destroyed and betrayed. One thing only (aniline), as far as is yet known, presents characters at all comparable to those of strychnia, and even this fallacy is guarded against by very simple precautions."

ON ECZEMA IN THE HORSE.

By H. Lepper, M.R.C.V.S., Aylesbury.

My dear Sir,—Since the year 1840, the time the disease termed eczema first came under my notice, when it appeared in a most aggravated form among the bovine class of animals, and most especially severe in lactescent ones, and soon extended to pigs and sheep; nor were poultry exempt from its baneful influence;—since that time it has visited this locality, in a greater or less degree, every year, the spring being, generally, its most favorable period of visitation. As time passed on it appeared in some degree to weaken its force, and I had thought that soon it might altogether disappear.

I regret, however, to state that during the spring and summer of the present year it has returned in a form almost as virulent as at any former period, and in many of our large dairies it has occasioned great losses.

Not many weeks since I had under treatment a very fine dog, having all the ordinary appearances of eczema. The feet were very tender, hot, and swollen, so much so that with difficulty he could be made to stand; the nose, lips, and ears were swollen and numerously covered with vesicles, the visible mucous membranes of a very florid colour, the bowels constipated, and the appetite impaired, with other febrile

symptoms. The treatment consisted in giving some little aperient medicine and applying unguentum simplex to the affected skin; diet, bread and milk. In the course of a few days desquamation took place, and the dog was convalescent.

My object in writing to you at this time is to report a well-marked case of eczema in the horse. To me, and, as far as I am able to ascertain, to the profession generally, it is a singular case. Although I have been surrounded by the disease, as it were, for more than twenty years, it is the first case that I have witnessed in the equine class of animals; indeed, I had thought that they were altogether exempt from this disease.

The history of the case runs thus, as near as I am able to describe it:

On the 21st day of June last I was requested to attend a five-year old chestnut mare, of the nag breed, about six miles from my residence, the property of Mr. John Vines, who is an extensive grazier, keeping a large dairy of cows.

I was informed that many of the cows were at this time suffering from eczema, and had been so for some time past, and as they fell ill with the disease they were taken from their companions and placed in a meadow in which the mare was kept; and on the day previous to my visit the mare was noticed to be standing in the field more quiet than she was usually accustomed to do, and a bleached appearance was around the tops of her hoofs.

On my visit I found her to be fair in condition, but off her appetite, looking empty, pulse about 60 in the minute; disinclination to move; a discharge issued from around the tops of all her feet; the visible mucous membranes were injected, having rather a peculiar appearance, very much resembling fresh-cut raw beef; I could discover no blisters within the lips, or on the tongue, but they existed thickly over the nose and in front of the head, extending to the ears; the bowels were slightly constipated.

I directed her to be placed in a convenient loose stable, to have a mild aperient, applied solution of Cupri Sulphat. to the feet, and ordered her to be liberally fed on such food as she would partake of.

I saw her again on the 24th, and found very little alteration to have taken place. She refuses all food except a little hay or cut grass. Those cuticular excrescences situated at the inside of the knees and hocks had fallen off, and an ichorous discharge issued from the exposed surfaces.

On the 26th there was a restless and anxious appearance about her; the pulse had increased to nearly 70 in the minute;

a considerable discharge took place from the coronets and the frogs, which were separated from the insensible frogs so that anything of a moderate thickness might be easily passed between them, and she refuses all food but hay. I advised milk gruel to be given in the place of water, and ordered daily a little tonic medicine combined with a slight diuretic.

On the 30th—She appears much weaker and is fast wasting in flesh; cannot be induced to take corn of any description, but drinks freely of the gruel; the discharge from the feet continues, and has become offensive. Ordered dry pulv. Alumini to be rubbed on two or three times a day.

July 2nd.—No appetite; appears weaker, and continues to waste in flesh. This state of decreasing of power went on gradually until the 19th, when the animal could not rise without assistance.

On the 26th she was still weaker, and could only stand a few minutes without being supported.

By the 29th she had wasted to a mere skeleton, was unable to stand when lifted up, pulse 80, takes a little milk occasionally; the powers of life appeared fast ebbing to a close, and death terminated her sufferings on the 1st day of August.

I had, unfortunately, no opportunity for an examination after death, but I requested to be supplied with one of the feet, which I have forwarded to you, that you may form some idea of the ravages the disease had made and the suffering of the poor beast.

I am, dear Sir, yours obediently.

To G. W. Varnell, Esq.

REMARKS BY ASSISTANT-PROFESSOR VARNELL.

Whether the disease alluded to by Mr. Lepper in the above communication is identical in its nature with eczema as affecting cattle, sheep, and some other domestic animals, I am not prepared to state. I have no doubt but many persons will consider that it is not. For my own part, I think there were presented many of its symptoms; and the phases were so very analogous, that some difficulty will be experienced in separating it from that disease. It is unfortunate that no examination was made of the mucous membrane of the alimentary and respiratory tracks, for, as it is, we have no knowledge whether those membranes were affected or not. The interior of the mouth seemed to have escaped vesication in this instance; which appears to be

the only marked difference, as far as locality is concerned, between the parts affected in this horse, and the ox tribe. Should other cases occur, and it is very likely they will, I see nothing in the nature of the affection to suppose that the mucous membrane of the mouth may not be similarly affected. The very circumstances under which the mare contracted this disease, go very far in support of its being of the same nature as that affecting cattle. As far as we know, the mare was free from any such affection at the time she was placed in the meadow, which locality was the especial repository for cows affected with *eczema*. Now if this disease can be communicated from one cow to another, and it is almost invariably believed that it can; is it not also possible that the mare in question contracted the disease from the cows that were placed in this field? I incline to the opinion that it is more than possible; I consider it very probable. Admitting the susceptibility to be but feeble in the *equine* species to take this malady, the chances of escape, nevertheless, would, in this instance, be reduced to their minimum. No circumstances could be more favorable for the disease being transmitted from one animal to another than in this instance. The meadow contained a number of cows with disease of their feet and mouth, which by their "trailing" and feeding among the grass, would of necessity leave upon the herbage the secretion from the *vesicles* and *ulcers* situated on their feet, lips, tongues, and teats.

The recording of this case is, in my opinion, of great importance, and the agricultural public, as well as the profession, may yet have greater reason to be thankful to Mr. Lepper for the trouble he has taken in communicating it.

Mr. Lepper appears to think that this is the only case of the kind on record. This may be the case as far as England is concerned, but I have, nevertheless, a faint recollection of similar cases having been related to me before, by some of the members of the profession. If I am right in this respect, the reading of these remarks may remind those who may have told me of them; and should they have any notes of the cases, or they are sufficiently imprinted on their minds, they may be induced to send me the particulars.

If further investigation should prove that this disease can be communicated from the *bovine* to the *equine* species, a necessity will be seen to take care that horses are not exposed to such influences. For my own part, I have long considered that I have witnessed many horses affected with a disease similar, if not identical, with that affecting the mouth, feet, and teats of cattle. In a short paper I read,

many years ago, before the members of the *Veterinary Medical Association,* on some of the diseases peculiar to the horses in the United States (see the 'Veterinary Record and Transactions of the Veterinary Medical Association,' vol. iii, page 192), I stated that I had (while residing in the States) seen a disease of the mouth and feet of horses, which in all its stages was similar to that affecting the same parts of cattle, &c., in England. This affection raged among the horses of that country, with more or less violence in various places, and also in a part of Upper Canada, but in about three or four years it gradually disappeared. By a perusal of the volume above referred to, it will be seen that the symptoms I then observed, especially in the feet, were precisely like those described by Mr. Lepper; and judging from the foot forwarded by him to the College, I have reason to think such was the case. In the western portion of Pennsylvania, being the part in which I at that time resided, and in the State of Ohio, it was thought by some persons that nearly one fourth of the horses were affected with this disease, and a great many died. In the eastern portion of the State of Pennsylvania and the western part of the State of New York, the feet of the horses, and but seldom the mouths, were attacked; and it was no uncommon thing for their hoofs to be *shed.*

In the early stage of this disease, small vesicles would appear on the edges of the tongue and buccal membrane, which would enlarge, and eventually coalesce with each other. At first, their contents would be as transparent as water, but as the disease advanced the discharge would become dark in colour, and, in a short time, offensive; the tongue would be also much congested and swollen. The vesicles likewise around the coronets would behave pretty much in the same way as those in the mouth; and a separation of the horn from the sensitive and vascular structures very soon took place.

From the dark appearance of the tongue in the latter stages of this affection, the disease was designated "*Black Tongue.*"

For a fuller account of the disease, as it existed in that country, I would refer the reader to the publication above alluded to.

THE OPERATION OF TRACHEOTOMY IN THE HORSE.—UNSOLDERING OF A PORTION OF THE TUBE IN TWO INSTANCES.

By J. B. Henderson, M.R.C.V.S., London.

Dear Sir,—As you seemed to consider the circumstances which I mentioned to you the other day rather remarkable, I send you a brief account of the particulars of the cases, for I feel certain that every one who performs the operation of tracheotomy, will do well to guard against the mishaps which I have just experienced, by paying attention to the proper construction of the tube they insert into the trachea.

The 20th of June, I performed the operation of tracheotomy on a fine, five-year old, bay cart-horse. A copious discharge from both nostrils soon ensued, and I made up my mind, on July 2nd, that I would keep the tube in two days longer; after which time, I thought my patient would be able to carry on respiration in the natural manner.

I paid him a visit, however, the next day, and on going into the stable I was met by a man in a state of great excitement, with the tube in his hand, which he said the horse had just coughed up, after many violent efforts. The shoulder of the tube was still attached to the neck of the horse by the strap, and it was very evident that the statement of the man was true, for there were the marks of the horse's teeth upon the tube.

I confess I was rather alarmed when I began to think of what the consequences might have been, had the tube become lodged in a part where it was impossible to move it, and I hurried off to see another patient, in the same street; in fact, one upon which I had performed a similar operation but three days before. I examined this tube, and to all appearance it was well soldered; so my fears were dispelled, knowing that both tubes were of the same manufacture as those used at the College, and, indeed, all over England. I therefore put down the accident as one of remarkable occurrence, which, perhaps, had never before taken place, and congratulated myself upon my patient's having relieved himself so easily of what might have proved a cause of death.

Three days after, on a Sunday morning, and therefore more awkward on account of assistance and appliances not being so ready at hand, I went to see my patient No. 2, and to examine his neck, and I then found the shoulder of the instrument detached from the tube, *in precisely the same*

way as the first one. I at once unbuckled the strap, and removed the shoulder as carefully as possible, for I could see the tube occupying its proper place, but in my attempt to lay hold of it, the horse started back and down it slipped. As I was certain that I had no instrument in my possession adapted to remedy this dilemma, I determined to call on you as soon as I could, but before I started I made the aperture in the trachea larger, thinking that perhaps a fit of coughing might come to my assistance during my absence. *This luckily was the case.* The horsekeeper, finding the animal was seized with a severe fit of coughing, watched him, and in this instance, too, the tube was forced out of the aperture in the trachea. I did not think it necessary to insert another tube in my first patient, but with regard to the second it was otherwise; but I took the precaution to have the two pieces of metal fastened together with wire, holes being drilled, and the wire threaded through. Other means I have no doubt could be adopted in the manufacture of these tubes, which would prove quite as effectual; but of this I am certain, that the general way of soldering the bent cylinder to the shoulder is unsafe.

Should you deem this subject of sufficient importance to make any comments upon it for publication, you are at perfect liberty to do so.

I remain,

Your obedient servant.

To G. W. Varnell, Esq.

REMARKS ON THE ABOVE, BY ASSISTANT-PROFESSOR VARNELL.

The above cases appear to me worth recording, not wholly on account of the results, which fortunately were satisfactory, but on account of the consequence that might have arisen, had not accident, for such it must be called, determined it otherwise.

Tracheotomy is never performed except in very urgent cases, and then only as a last resource. The operation itself is very simple, as every veterinary surgeon is aware; and no particular merit is due to any one for being able to perform it. But with regard to the time, in any particular case, when it should be performed, or whether it should be done at all, requires not only a sound judgment to be exercised, but also an accurate diagnosis to be made of the pathological condition of the parts affected.

In cases of laryngeal disease, impeding free respiration, no

one would think of opening the trachea, and inserting a tube, until all chances of the animal's recovery without such an operation had vanished. When the necessity to do so has arrived, and the veterinary surgeon promptly performs the operation, the owner of the animal, and those also who may happen to witness the operation, are not only gratified but greatly surprised at the sudden relief afforded; and, should the animal survive, the practitioner is extolled for his ability; or should the horse die, even although this operation be performed, it will be considered that the practitioner did all that could have been done in such a case. But if he loses his patient through defective instruments, as might have been the case with the two horses referred to by Mr. Henderson, the owner of the horse would most likely attach all the blame to the operator; and if he were informed of the real cause, he would, as a matter of course say, the operator ought to see that his instruments are perfect, and fit for the purposes that he is using them for.

The veterinary surgeon, when he buys an instrument, merely looks to its form, and suitability for the purpose he requires it. If, for example, he is purchasing a scalpel, he does not use any means to ascertain if its blade is made of iron, "case hardened" and polished, or whether it is a fine piece of cast steel: he expects it is made from the latter. The same would be the case if he is buying a tracheotomy tube. If its form and dimensions are what he wants, he takes it for granted that the manufacturer has put its parts together sufficiently strong to resist the ordinary force the instrument has to sustain. Should these remarks come under the notice of instrument makers, I hope it may induce them to be more particular in seeing that their workmen make sound articles. In manufacturing the common tracheotomy tube, I would suggest that the tube be passed through the shield about one eighth of an inch, or a little less. A small collar or ring should be placed on the small protruding portion, and then well soldered. This, if neatly done, would not be unsightly, and would ensure safety.

It is very remarkable that about the same time those cases were forwarded to me by Mr. Henderson, a case nearly identical with them took place in the practice of human medicine, and so forcibly is thus shown the necessity for more attention being paid to the manufacturing of those kind of instruments, that I am induced to extract the particulars of it, which are taken from the *Edinburgh Medical Journal* for August, p. 187.

"*Tracheotomy tube dropped into the left bronchus.*—Mr. Spence mentioned the particulars of a rare accident which had

come under his notice. A man had had tracheotomy performed several years ago, by Mr. Edwards, and had since worn a double tube. Yesterday, while riding on horseback, the rim of the tube, which had been gradually wearing, gave way, and it fell, as the man expressed it, 'into his chest.' The man went at once to Mr. Edwards' house, but as that gentleman was from home, his assistant put in another tube, and sent him to the hospital, where he came under Mr. Spence's care. When Mr. Spence saw the patient, he was breathing quite freely, and the sounds on auscultation were very much the same on the two sides of the chest. A probe was in the first instance passed down into the right bronchus (into which it was generally said that foreign bodies fall,) but nothing was felt; it was then passed into the left bronchus, and the tube was at once felt. An attempt was then made to extract the tube without enlarging the wound, but was unsuccessful. Chloroform was then administered, the opening was enlarged by cutting through two or three rings of the trachea, a pair of bent forceps was introduced, the tube was seized, drawn to the opening, and then extracted. Mr. Spence observed, that so far as he knew this was the only case of the kind, but it should teach cutlers to make their tubes in two lateral halves, and then join them together; for when, as at present, the shield was fastened to the tube, the soldering must in the course of time give way."

OPERATING BED FOR HORSES.

By R. H. Dyer, M.R.C.V.S., Waterford.

There is not, perhaps, a more important thing connected with a veterinary establishment than the *bed* on which we operate upon our unfortunate patients.

The human surgeon has all the necessary appliances at an infirmary, by means of which he is enabled to make many of the ills that human beings are subject to as pleasant and bearable as possible under such trying circumstances. We, on the contrary, are not, I fear, sufficiently careful in the use of these appliances, and, so long as we provincials can procure the means of doing that which will enable us to live, as a general rule, we seem content therewith. I repeat, the most important portion of our establishment is the bed, or ground, upon which our patients are found struggling after being thrown down and secured for an operation.

This is a subject to which I have for many years directed my attention, and I flatter myself I have succeeded in obtaining one of the best and cheapest beds that can be had for this purpose. I am fully aware a more elegant one can be formed, but whether it would answer all the purposes of the veterinarian is not what I am about to discuss. I merely wish to direct attention to that which I have had in use for some six or eight years. Having had occasion, within the last few days, to enlarge the dimensions of the ground, it led to the desire to make known the plan to the profession, through the medium of your publication.

Firstly, a deep hole is dug, say from three to four feet in depth, the size of the ground or bed wanted (it should not be less than from twelve to fifteen feet square), into which are placed bundles of furze, which are trodden down and covered with exhausted tan. The hole should be stuffed well with the furze to the top, and a few inches of tan placed upon it, and over this a little straw, which will be found to form as firm and elastic a bed as can be made, and, when properly constructed, be as good as india-rubber. I by this mean to be understood to say, that there will be found a sufficient amount of elasticity in it, so as to prevent the untoward accidents which sometimes take place in the casting of horses.

I have often shuddered when I looked at some grounds I have been called upon to operate upon. No amount of straw will compensate for a hard, stony piece of ground. I have seen some horses rebound a height of several inches when thrown upon these terribly hard places. Besides, a large quantity of straw is often in the way of the operator, more particularly when he is using the actual cautery.

I have thought these few remarks upon this subject might not be unacceptable to some of your readers, as I write from experience.

ON THE LIABILITIES OF VETERINARY SURGEONS, AND THE PROPOSED VETERINARY PROTECTION SOCIETY.

By Alex. Lawson, M.R.C.V.S., Bolton.

I read with interest and pleasure the remarks of Professor Brown, and your own editorial, on this subject in your number for last month, and have often thought that an association of the kind referred to by the professor was much wanted,

and would be a great boon to the profession at large. There are other cases of hardship than those referred to by Mr. Brown, which arise from no fault of the practitioner, and in which our employers, either from ignorance or selfishness, are apt to be unreasonable, if not unjust, towards us. I shall give two instances; viz., First, fatal or injurious results from castration. Second, pricks in shoeing. Now every practitioner knows that castration may be performed in the most careful and scientific manner possible, and yet you may have injury to the spinal cord in casting, or from the excessive straining and struggling of the colt when down; or peritoneal inflammation may set in afterwards and death ensue, baffling the most approved remedies for the prevention of such result. I have heard of practitioners in cases of this sort, although honestly free from blame, giving a considerable sum of money to prevent annoyance and exposure, which might lead (especially with young practitioners) to further loss from damaged reputation, &c.

But the second case appears to me the hardest of all; viz., when a claim is set up for damages for injury from a prick in shoeing. I will not only say that every veterinary surgeon, but every person who has had much to do with shoeing, or seen but a moderate degree of forge practice, must know that *every* horse-shoer has at times pricked horses. Not the tyro in the art, but the most experienced workman, and this not always when he is careless, indifferent, or incapable, but frequently when he is in best trim, and particularly desirous of making a good job. If our employers were better acquainted with the anatomy of the foot, knew the slender thickness of horn on which the shoe has to work, the wonder would be, not that a horse was occasionally pricked, but that there were so few; and we should not then be subject to the vexatious annoyance on this head which is so grievous and tantalizing. Suppose we put on a shoe, for which we charge 10*d.* or 1*s.*, and the horse is accidentally pricked; bad consequences ensue; a claim for damage is made, and sustained, as I have heard, by some of our local judges. Is the charge made proportioned to the responsibility? or is it fair or reasonable that a claim of this kind should be heard of at all, unless on the ground of intent or sheer carelessness, which would be difficult to prove? Now, the formation of a society such as proposed in your Journal—call it "The Veterinary Protection Society," if you will—a very suitable title—would do much, if not to obviate, at least to soften down these evils.

I hope the matter will be generally taken up by the profession. I for one am ready to join, and do whatever may be

thought necessary, by subscription or otherwise, to forward the movement.

One word more—I venture to assert that if such a society had been in existence, the Bill for relieving veterinary surgeons from serving on juries, instead of being lost by the casting vote of the Speaker of the House of Commons, would now have been *British law*.

BOTANY AS APPLIED TO VETERINARY SCIENCE.

By W. Watson, M.R.C.V.S., Rugby.

(*Continued from p.* 261.)

In my last paper in connexion with the botanical characters of plants which are used as food for our domestic animals, I concluded a brief notice of those plants whose roots, stem, and leaves yield a large supply of food. I shall now proceed to notice the third and equally important division, viz., those plants whose seeds afford an abundant and valuable supply of food, not only for animals but man himself. I shall proceed, therefore, first to describe those plants extensively cultivated everywhere in this country, viz.:

Avena sativa (common oat), *Hordeum distichum* (common barley), and *Triticum vulgare* (wheat). Found as they are, growing in luxuriant abundance nearly everywhere around us, and serving as the great source from which both man and animals are supplied with food, all persons must be sufficiently familiar with their general characters as to need but a very brief description of them. All these plants, like the grasses which they so much resemble, belong to the class of *Endogens*, and to the natural order *Gramineæ*, both which class and order have already been described. There are a great number of varieties of each, all more or less valued according to the nature of the soil and district in which they are grown, but a brief description of those most generally cultivated will be sufficient to give a general insight into the botanical character of the whole.

Avena sativa (common oat), *Panicle* spreading, equal,—*Glumes* generally two-flowered, and longer than the florets; the upper nine-ribbed—*Paleæ* two, the lower bifid, with a twisted awn at the back—*Florets* smooth, bifid, and toothed at the point.

The common oat has been cultivated in different parts of

Europe for centuries, and was found growing wild on the island of Juan Fernandez, but at what period, or from what country it was first introduced into Europe is not known. It is an annual plant, largely cultivated in many parts of England, but especially so in Scotland, where it constitutes a large supply of human food. It thrives on a far wider range of variety of soils than any other British cereal, and "flourishes best in the middle and even northern regions of the temperate zone, becoming increasingly sickly and unproductive as it reaches the tropics." As food for animals all parts of the plant are valuable. In some districts oats are consumed in the green state; the straw, also, is better than any other for fodder, but the grain is the most valuable part of the plant. As food for horses it is far superior to any other grain, its use for this purpose being familiar to every one. Much depends upon the age and condition of oats as food for horses, as, when given new, they are apt to disagree with the digestive organs, and to produce a laxative effect; and, when harvested too soon, they become of a dark colour and have a disagreeable odour, and resemble mowburnt hay in their effects upon the kidneys. Attention should also be paid to the manner in which they are kept after being thrashed, as if they are then in "bad condition" and allowed to remain heaped together for any length of time, they are apt to favour the growth of a fungoid parasite of a very poisonous nature, the injurious effects of which were recorded by Professor Varnell in a paper to the *Veterinarian* of February last.

Oats are largely consumed as human food in many parts Scotland in the form of oatmeal, and are also used by the distiller in the manufacture of whiskey.

"*Hordeum distichum* (two-rowed or common barley). *Spikelets* three, the middle one only fertile, the two lateral barren and beardless; *Glumes* two; *Paleæ* two, the lower one furnished with a very long awn; *Scales* obtuse, fringed; *Styles* feathery; *Grain* adhering to the *paleæ*."—Lindley. This, the more commonly cultivated barley, was introduced into this country from the south of Europe at a very early period. There are a great many varieties, differing in value according to the soil and situation in which they grow.

Barley is considered constitutionally more tender than many other cereals, and, in some instances, it cannot stand the rigour of our winters; "and yet it grows wild over a wide extent of both the old world and the new, and it is successfully cultivated athwart a greater breadth of the globe than any other of the valuable grains."

It is an annual plant, thriving best on a rich light soil. It

is sometimes consumed by animals in the green state, being then considered especially valuable for milch cows. Its grain is also used, both whole and when ground into meal, for feeding cattle, sheep, and pigs. As food for horses, barley, in any state, frequently disagrees with the digestive organs, producing diarrhœa, &c., and should not be given when other corn can be obtained.

One of the chief uses of barley is for the making of malt, in which condition it is sometimes given to horses who have been suffering from debilitating diseases with very beneficial results.

"*Triticum vulgare* (wheat)—*Ear*, four-cornered, imbricated; *rachis* tough; *spikelets* three or four, flowered; *glumes* ventricose, ovate, truncated, compressed below the point; *grain* naked."—Lindley.

This plant, of which there are a great number of varieties, is familiar to every one as constituting the source from which we obtain one of our chief supplies of food.

As food for animals, in times of plenty it is used, when ground into flour, both for cattle and pigs, but is anything but good food for horses, and when given to them should always be crushed and mixed with other dry food, such as cut hay, &c. When partaken of whole by horses, most injurious and very frequently fatal results have followed.

The following table, copied from a little work by Mr. Scott Burn, is worthy of attention, as showing the comparative value of the three kinds of grain above described:—

	Wheat.	*Oats.*	*Barley.*
Water	12·26	13·09	14·65
Flesh-forming constituents .	11·64	11·85	10·84
Heat- and fat-producing substances	68·74	63·34	68·31
Woody, indigestible fibre . .	2·61	9·00	3·45
Inorganic matters (ash) . .	1·75	2·72	2·75

(*To be continued.*)

ON INDIAN HEMP IN TETANUS.

By "Argus."

India, *May* 15, 1862.

Since reading Mr. Hoey's communication in the *Veterinarian* of February last, advocating the use of Indian hemp in the treatment of tetanus, I have had an opportunity of trying

that agent, and will give you a brief history of the case in which I used it. On the 30th March, a large chesnut, stud-bred trooper was admitted into hospital with all the symptoms of tetanus, viz., extreme rigidity of all the voluntary muscles; erection and quivering of the tail; inability to move the head or bend the neck or body in the slightest degree; the legs planted stiffly, wide apart; distressed expression of face; extreme nervous excitement upon any person entering the box or approaching him, the membrana nictitans being protruded and the head thrown up on such occasions, accompanied by a groan of distress if approached closely or touched; the jaws, though not completely locked, were nearly so, it being impossible to open them beyond half an inch. The horse could drink water, or a thin, sloppy mash, when it was held up to him, but his doing so was accompanied by that peculiar sucking noise so common in cases of this kind. As there was no wound of any kind, and as the animal had received no injury, except a fall by which he had slightly injured his shoulder, *three months* previously, I came to the conclusion that it was a case (probably) of idiopathic tetanus.

It was impossible to give medicine in the shape of bolus, and as any handling or an attempt to raise the head produced intense and painful excitement, I determined not to give drenches. After emptying the rectum with a common clyster, an enema was prepared, containing—

Aloës, ʒvj;
Extr. Belladon., ʒij;

and administered. A blister was then applied along the spine, and the patient left in a dark, loose box, with instructions that he should be kept as quiet as possible.

On the second day, Ext. Belladonnæ, ʒiij, in solution, was administered per anum, and one drachm in solution applied over the blistered surface. The medicine of yesterday began to act, and an immense quantity of hard, dry fæces was voided.

On the third day the blister was washed off, and one drachm of Ext. Belladonnæ in solution applied. On this day I commenced the use of the Indian hemp. Twelve ounces of green hemp, pounded, were boiled slowly in five quarts of water until reduced to two and a half quarts, when the decoction was strained and allowed to cool. This was then divided into three portions, one was ordered to be given as an *enema* in the morning, one at mid-day, and one in the evening.

On the sixth day I had ʒij of Ext. Belladonnæ in solution

rubbed over the thighs, and administered per anum, ʒiv of aloes, and ʒij Ext. Belladonnæ in solution, stopping the Indian hemp for that day, and resuming its use on the next.

On the twentieth day I discontinued all medicine, and left nature to herself until the twenty-fifth day, when I again began the daily use of the hemp, which was continued until the thirty-fifth day. The patient was then nearly well, and I finally discontinued the hemp, and had the horse walked out very gently every morning for a quarter of an hour in a quiet spot. Since then he has rapidly improved, and does not now show any sign of tetanus. He gets smart walking exercise for an hour every morning, and the same in the evening. Yesterday I saw him trotted, and he moved all right. While trotting he took it into his head to break away from the syce and have a gallop to himself, when he showed plainly that he had regained the use of his limbs by jumping and kicking about like a colt.

During the whole time the case was under treatment the bowels acted freely, the quantity of faces passed every twenty-four hours exceeding that of a healthy horse, but being hard, dry, and in very small pellets. For the first week the act of passing the fæces was productive of pain and general spasm, as was also that of staling, but this gradually became less, and ultimately disappeared.

The patient was fed upon thin mashes, which he sucked in, making a disagreeable noise in so doing. After the first twenty days, however, he was able to eat solid food of an easily digestible character, and soon afterwards to pick grass from the ground. His appetite is now ravenous, and he is quickly regaining his former condition.

I had never tried Indian hemp before. The perusal of Mr. Hoey's letter suggested its use to me, and I must confess that I am inclined to put considerable faith in it now; but before quite making up my mind as to the merits of the drug, I should like to get hold of a case of *traumatic tetanus,* with *complete* trismus, and place it under treatment.

In the preparation of the hemp, you will see that I have followed Mr. Hoey's instructions: it is but fair I should acknowledge this. I used Ext. Belladonnæ and aloes, so as to vary the treatment, and prevent the usual effect of the uninterrupted use of any medicine for a length of time, *i.e.* inefficiency.

Facts and Observations.

PLEURO-PNEUMONIA IN CATTLE AND SCAB IN SHEEP IN AUSTRALIA.

By advices from Victoria we learn that for the past two years the colony has been suffering fearfully from pleuro-pneumonia, and whole hecatombs of infected and suspected cattle have been burned and destroyed. The scab is now rife among the sheep, and large slaughter is being executed among them. In the earlier part of the month of May a flock of 3780 was slain and burned at Burrumbang, on the Murray, eighty miles below Swanhill.

PREVALENCE OF PARASITES.

Dr. Spencer Cobbold is inclined to question the truthfulness of the general opinion, that tame quadrupeds and others kept "cribbed, cabined, and confined," are much more troubled with parasites than those fortunate individuals who roam at large "o'er hill and dale," without any human being to molest them. So far as *external* parasites are concerned, he says it may possibly be true, yet even this he very much doubts; but as regards the frequency of *internal* parasites, he has satisfied himself of the erroneousness of the general belief.

ROYAL SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS.

At the last meeting of the committee of this society, at which Mr. W. A. Mackinnon, M.P., presided, the secretary announced that the munificent sum of £1070 had been given expressly for the establishment of a society at Madrid for the suppression of cruelty to animals in Spain. A sub-committee was appointed to carry into effect the intentions of the donor. The society has already been instrumental in obtaining the interference of the Emperor of the French with the practice of vivisection, and has also assisted in forming upwards of thirty branch associations in the principal cities of the world, in addition to auxiliaries in the leading towns of the United Kingdom.

CANINE MADNESS.

M. Berthaud states that two mad dogs were lately taken to the Veterinary School at Alfort, and after being shut up in a cage they exhibited all the symptoms of rabies, making desperate efforts to escape and attack the bystanders. After some days both had puppies, and alternately they manifested maternal affection and gave way to paroxysms of madness. At length they died, and the puppies are being kept to see if they will become affected with rabies like their mothers.

SUSPECTED HYDROPHOBIA.

A dog manifesting all the symptoms of hydrophobia was shot a few days back in the Rue Notre-Dame-des-Victoires. The animal, which belonged to M. Cardot, of the Café Français, near the Gymnase, was taken to the Veterinary School at Alfort, where, on its being subjected to an autopsy, a quantity of hay, plaster, and pebbles was found in its stomach. This is not the first time that a perversion of the appetite and a tendency to greedily swallow foreign substances have been remarked as a precursory sign of hydrophobia, like the change of voice and particular howl raised by dogs menaced with that terrible malady. A large cat which had licked the blood of this same dog showed also symptoms of madness, and was obliged to be killed. Fortunately no one had been bitten by the dog.

NEW TEST FOR STRYCHNIA.

Mr. J. Horsley has found a more powerful reagent for strychnia in the nitro-prusside of sodium. He says a comparison between it and the bichromate of potash is immensely in its favour, the extreme limit of detection (where no other alkaloid is present) being $\frac{1}{100,000}$th; indeed, 75,000 is quite marked, while the bichromate scarcely reaches 3000. There is also a greater degree of intensity, as well as persistency of colour, and he considers it *the* test *par excellence*.

It is useful as a precipitant of strychnia, the crystals being in the form of very long spiculæ and sometimes needles, which strike a splendid colour with sulphuric acid.

Mr. Horsley also states that by the above test the plea for the non-detection of strychnia in the presence of morphia no longer holds good, as experiments with five and even ten times the amount of morphia have proved.

In reference to the above test, Mr. J. E. D. Rodgers, writing to the editor of the *Chemical News*, says, "Some years ago, while engaged upon an extensive series of experiments with strychnine, among other reagents the nitro-prusside of sodium was tried by me, and put aside as valueless as a means of detecting that alkaloid. It was, therefore, with much surprise that I read Mr. Horsley's statements in your valuable journal of the 21st ult. He has evidently fallen into a mistake by using something else for the nitro-prusside of sodium, probably the ferri-cyanide of potassium, as the former reagent has no reaction whatever upon strychnine under the circumstances detailed."

ANTIDOTE FOR STRYCHNINE.

It is stated in the *Sydney Morning Herald* that a valuable sheep dog belonging to Mr. Mortyn, J.P., Murrurundi, having accidentally eaten this deadly poison, a dose of arsenic was administered to abbreviate the animal's sufferings, but, strange to say, it had a contrary effect, and the dog recovered. The same peculiarity was observed on two other occasions.

WANTON CRUELTY.

During the past few days some maliciously disposed person has been strewing poison about the streets of the city of Exeter, for the purpose evidently of killing dumb animals. In Cowick Street, St. Thomas's, several dogs and cats have been poisoned with strychnine, which was placed on large heaps of rubbish, and on Friday last a very valuable Newfoundland dog, valued at £50, the property of Mr. Long, of the Bristol and Exeter Railway, was thus poisoned. The poor animal picked something off one of these heaps and ate it, and within a quarter of an hour it died. We understand Mr. Long has some clue to the person by whom the poison was laid.

THE VETERINARIAN, SEPTEMBER 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

ON THE EXAMINATION OF PRACTITIONERS.

Although, as public journalists, we have given insertion to communications respecting the examination of veterinary practitioners, men who have received no scientific education, our readers are not therefore to infer that we are advocates for its adoption. Such a course of procedure would be to ignore the schools, stultify ourselves, and render nugatory all the good that we, as a profession, have been for many years endeavouring to obtain. The foundations which have been so laboriously laid would be ruthlessly uptorn, and we should soon go back again to the dark days of farriery, the fair regions of science being enveloped in the mists of pretension. Such must not be permitted to take place. We have no hesitation in saying that he alone can pass an examination as to his fitness to practise a scientific calling who has been scientifically educated. Principles ever must be his guide. We do not, of course, mean to imply that there never was a self-taught scientific man; far from it. We are speaking generally, and as to the results which most likely would follow the examination of those who have never received collegiate education; for if some are now admitted as members of the profession, what is to prevent others following? Would not this be unjust to those who have spent their time and money in the acquirement of knowledge, and passed the prescribed ordeal? We have no doubt whatever that among practitioners are to be found many men of sterling worth and strict probity, and possessing those practical abilities which have justly won for them the esteem and confidence of their employers. But this is not enough as far as the weal of the profession is concerned, and its advancement. Mere practice never yet developed a principle, and without correct foundations be laid, the super-

structure must ever be wanting in stability. Long, far too long, was mere routine allowed to have its sway. No light by it illumed the art of veterinary medicine—for science it could not then be designated—and it was only after the establishment of the schools that the genial and invigorating influence of scientific truth was felt. We have progressed hitherto; slowly it may be, yet much has been accomplished. Let us not lose what we have gained.

Well was it recently said by Mr. Gladstone, that "the advancement which is now taking place is a fact full of meaning; it is an indication of the movements of the times, and the development of those faculties by which man is fitting himself more and more by the efforts of each generation in succession to contend with those difficulties of outward nature amidst which Providence has placed him for the purpose of evoking his energies, and to make the gifts and bounties of Providence available for his comfort and his happiness. This is the opening almost of a new chapter in the condition of man. I do not mean that it is the beginning of such efforts, but it is the beginning of them on a new scale, with a new system, with new appliances, and with new means for the intercommunication and interchange of knowledge; and it marks the fact that in the list of elements that belong to human civilisation these great operations of art and science, applied to the external world, must henceforward be included, and hold a conspicuous place. And it will be our own fault if the addition of that new chapter fail to be a great blessing. There is no reason why it should displace anything. All these things ought to continue to grow and thrive, and that which we introduce we ought to add to what we have enjoyed before, and not substitute for what we have been enjoying. The principle of the divine life in man must continue to animate his existence if he is to exist for any purpose of good. The cultivation of his intellect, the study of the beautiful in all its varied phases—these should continue to thrive; and let us see without jealousy the development of new powers in the mind of man, or new applications of those powers, in order to meet the unfolding wants of society."

We have adverted to the injustice that would be done to

others, to those who have devoted a considerable portion of the earlier period of their lives to study, and who are still desirous of making principles their guide and reasons for acting. On this account they must be contented to be throughout life a student, early and late acquiring information connected with their division of science—for ever learning, and yet leaving much unknown.

Nor for a moment can we entertain the idea that a *qualified* examination, so as to meet the wishes of these candidates, can be instituted. That would be to alter the character of the Board of Examiners altogether. It is not likely that persons of scientific acquirements can be expected to sit in judgment on men whose lives have been devoted to simple practice, however successful it might have been, and who are not conversant with governing principles, for an inquiry into these must ever constitute the greater part of a scientific examination. But after all, can the request be consistently conceded? The schools and the profession constitute one incorporated body. The Council, it is true, can make bye-laws, but that they will do only for the good of the body; and we confess that we fear the consequences of such an infusion as that we are referring to. We are, however, very glad to know that we are in possession of that which is worth being participated in;—nevertheless we would not that some persons should have it on easier terms than others. Let all pursue the same legitimate means, and may success attend all.

"Suum quique."

THE EXISTING OUTBREAK OF THE SMALLPOX OF SHEEP.

The unexpected appearance of smallpox among the sheep in Wiltshire has, as might be expected, created a considerable amount of anxiety, more especially in the agricultural community. The remembrance of the past recalls the serious losses which were sustained, and the expense, care, and trouble, that all had to endure whose flocks became affected. The sad scenes of 1847-48, -49 and -50, rise

vividly before our memories, and we fear lest they should be again repeated. Nor are these fears lessened when we compare the circumstances connected with the present and the past outbreak. The first occurrence of the malady was satisfactorily accounted for, while to the second no clue has as yet been obtained.

Hitherto we have regarded the smallpox as spreading only by contagion; now we must ask whether it can have a spontaneous origin? If the latter, no flock is safe, nor any part of the country secure. That which has occurred in Wiltshire may happen to-morrow in Sussex, and the next day in the midland counties. Having been consulted on the discovery of this disease by the owner of the animals, we have pretty well exhausted our stock of surmises for its introduction without making much progress towards a satisfactory explanation of the circumstance. The part of Wiltshire where the malady made its appearance is peculiar for its isolated position. No foreign sheep travel its roads, nor have any been known to be purchased by the butchers of the neighbourhood. The flock, consisting of 992 ewes, 9 rams, and 710 lambs, in which the disease originally manifested itself, has had no fresh animals, male or female, introduced into it, nor has it been commingled in any way with other persons' sheep. From the means which we promptly adopted it was hoped the disease would be confined to the one flock in question, but we regret to say that it has shown itself in another, which was located about a mile distant. The fatality has been most serious, and still continues, so that it is impossible at present to estimate the *percentage* of deaths among the *natural* cases of the disease. Inoculation has been had recourse to, and with the most beneficial results, for by it probably the lives of from two to three hundred sheep have been preserved, and an equal number of the lambs. At present the deaths from the *inoculated* disease have had to be reckoned by twos and threes only, while the ultimate ill consequences of the malady from ulceration and sloughing of different parts of the body, and the necessary emaciation of the patients, have been entirely prevented.

Hereafter we shall hope to give the fullest particulars of this sad visitation and the prophylactic means had recourse to. These questions cannot now be discussed, but in the meantime we may exhort our readers to be on the look-out for smallpox, and for combating its fatality by inoculation to take the virus from the most benign case, to insert it with a mere prick of a finely ground needle, in one place only, and so superficially that not a stain of blood shall be seen.*

THE JURIES BILL.

In our last number our readers were informed that the members of the Royal College of Veterinary Surgeons, in common with pharmaceutical chemists, had been removed from the list of persons exempted from serving on juries by the casting vote alone of the speaker. On the bill being returned by the Commons to the House of Lords, the clause, so far as it related to pharmaceutical chemists, was, however, on the motion of Lord Wensleydale, reinserted. This was subsequently confirmed by the Commons, so that pharmaceutical chemists now enjoy the same privilege as physicians and surgeons. We doubt not that equal justice would have been done to the members of our profession but for the unfortunate circumstance that the noble lord, Lord Portman, who had undertaken our cause was unexpectedly called into the country, and therefore could not be in his place in their lordships' house when we most needed his support.

A knowledge of his lordship's absence from town only reached those who were taking an active part in the matter on the day that the bill was to be reconsidered, and far too late to provide for the difficulty. For a time we have, therefore, to bear with disappointment, but this must not discourage us; rather, indeed, should it strengthen our efforts, and lead us to mature plans which shall be crowned with success by providing for all emergencies.

* Since these remarks were sent to press we have received a telegram announcing a further extension of the disease, and requiring our immediate attendance. Our worst fears would thus appear to be about to be realised.

Extracts from British and Foreign Journals.

SMALLPOX IN SHEEP.

We have hitherto refrained from giving publicity to a most malignant and fatal disease which has broken out, and is still continuing its ravages in one of the largest flocks in the neighbourhood of Devizes, because we were unwilling to create unnecessary alarm, and were in hope that the frightful visitation might have been arrested, and the disease got under, without damaging the reputation of what has for the last fifty years been regarded as one of the most healthy flocks upon the Beckhampton downs.

The matter, however, has become so generally known in this immediate district, and the disease has now so completely impregnated the whole flock, that, for the sake of flockmasters generally, it seems desirable that some short notice of the nature of the attack, and the means which are being taken to subdue it, should no longer be withheld from publication.

It is now about five weeks ago that Mr. Joseph Parry, of Allington, was riding alongside one of his folds, containing about 300 two-year-old ewes, when he observed one of the ewes lying by the hurdles. The poor animal looked in a pitiable condition, soon breathed its last, and was put out of the way, and for the time nothing more was thought of the occurrence. But in a day or two after other sheep in the same flock showed symptoms of illness; exhibiting great internal suffering, loss of appetite, heaviness and indisposition to move, and general prostration. The two-year-old ewes had, up to this time, been kept with their lambs; but thinking it better to separate them, the latter were now removed and put with other lambs upon the farm, the former being turned amongst the general breeding flock—making altogether 1000 ewes and 700 lambs.

The nature of the attack from which the two-year-old ewes were suffering was then little dreamt of; but it soon became unmistakably apparent that, whatever it was, it was eminently contagious, for in the course of a fortnight the same symptoms began to show themselves among the elder ewes and among the lambs, and for days in succession as many as twenty and thirty of the ewes died in the most loathsome state of disease—their bodies covered with pustules, and

a viscous matter running from the nose and from the eyes, rendering the sheep completely blind, and emitting the most foul stench that can be conceived.

Nothing that could be given to the poor creatures seemed in any way to alleviate their suffering or arrest their death; and finding that no one in the neighbourhood could give any satisfactory explanation as to the nature of the malady, Mr. Joseph Parry went to London last Monday week, to consult Professor Simonds, the well-known lecturer at the Royal Veterinary College. After hearing Mr. Parry's explanation of the symptoms, Professor Simonds came immediately to the conclusion that the disease from which the sheep were suffering was *smallpox;* but as smallpox has never been known to make its appearance except through infection—as, wherever it has appeared, its origin and propagation have always been traceable—its introduction into Mr. Parry's flock was perfectly unaccountable. Every suggestion which the professor could offer was at once met by Mr. Parry. There had been no change on the female side of the flock for at least half a century. New male blood was only introduced once in two years, and it was now two years since Mr. Parry had purchased or hired rams from another flock. Neither could it have been imported by the shearers; as all the flocks which the same shearers had shorn this year, both before and after Mr. Parry's, were known, and in neither was there the slightest symptom of disease. In short, there was no traceable means of accounting for the visitation. A "chill" could not possibly produce it, as a common cause of illness would not produce a special disease of this description. Its spontaneous appearance, therefore, is a thing unheard of. Moreover, it is a disease unknown among English flocks; the only occasion of its appearance here having been in 1847, when some Merino sheep that had just been imported were sold with the smallpox upon them at Smithfield market. This was the first known appearance of the disease among sheep in England; and although it was then unfortunately communicated to two flocks belonging to Mr. Statham, a farmer at Datchett, near Windsor, and Mr. Weale, of Pinner, and for a time found its way into Norfolk and Hampshire, it was ultimately eradicated; and from that time to the present there has been no known instance of smallpox in sheep in this country.

To account for it in the present case, therefore, seemed impossible, inasmuch as Mr. Parry's had always been a notoriously healthy flock—well-tended, carefully fed, and with all the advantages of fine down air. Still, from the

symptoms, Professor Simonds had no doubt about the fact; and his visit to Allington on Friday last fully confirmed his previous persuasion. On examining the sheep he found them suffering in almost every stage of the disease. Some in which the pox had first shown itself exhibited a staggering gait, with slight fever and swelled eyelids; in others, when it had become more fully developed, red spots (easily discernible upon the bare parts on the inner surface of the legs) were found thickly studded over the body; whilst in those where the complaint had still further advanced, pustules (in form like the heads of ordinary smallpox) and malignant ulcers, emitting a thin, stinking matter, were the distinguishing features of the malady. A more loathsome sight than the sheep exhibit in this advanced stage can hardly be imagined. Previous to the visit of Professor Simonds we had ourselves been to Allington, and seen some scores of the worst cases in a large orchard which had been set apart as an hospital, and anything more wretched we never witnessed. Some uttering tones expressive of intense pain, some in the last throes of death, others dead; the animals lay scattered about the grass, sending forth a stench that seemed to poison the very air, and so diseased that the application of the slightest force separated the wool from the skin.

That such a disease should be highly contagious will readily be imagined. An instance is related (when it was introduced into England by the Spaniards in 1847) of its having broken out in a flock penned some distance off, but in the same field, while feeding off rape, clearly showing that the infection was carried in the air from one flock to the other. Considerable danger has in the same way arisen on the Continent (where the disease is well known), from the driving of a healthy flock on the same road or on the same down which had previously been travelled over by diseased sheep, or by the immediate transit of a sheep-dog or a shepherd from one fold to another. But whilst it is so highly infectious to sheep, it is by no means so to other animals or to human beings. Cases are recorded in which children of all ages have been inoculated over and over again without any specific disease resulting; and the like experiments upon the cow, and even upon the goat, have been equally unavailing.

So far, it is satisfactory to know that the disease is not likely to affect those whose duty may bring them in immediate contact with it; and that it will, in the present instance, be confined to Mr. Parry's flock no person can more anxiously desire than Mr. Parry himself. Every precautionary means that could be adopted to prevent the spread of the malady

were taken by that gentleman immediately its true nature became known; and as we have heard of no single instance in which any symptom of its communication to the neighbouring flocks has shown itself, we may hope that the disease will be eradicated without going further.

Upon examining the flock on Saturday last, Professor Simonds found that a great number of the sheep had already passed through the most trying part of the malady, whilst some (as many as 170) were declared by him to be perfectly convalescent. This being the case, it is impossible to say how long the disease has actually impregnated the flock; but to reduce its continuance to a certainty, and as the most effectual means of preserving those that have not already been attacked, Professor Simonds suggested that the whole of the sheep should at once be inoculated. And having placed the case entirely in the hands of the professor, Mr. Parry assented to this proposition, and the whole flock of 1700 sheep and lambs (exclusive of those which have died and those which have recovered) are accordingly at this moment either in an incipient or malignant state of smallpox. The trouble, inconvenience, and expense of this process no one who has not passed through it can sufficiently realise. The whole of the flock have had to be divided into small numbers, and provision has to be made to classify them into separate folds or meadows as they reach certain stages of the disease, so that they may be carefully watched and provided with such things as are best suited to the malady in its various gradations; and as these gradations occupy a month to develop themselves, the inconvenience and anxiety occasioned on a farm, especially at this busy time of the year, are immense.

It is said that where inoculation has been resorted to the duration of the disease is diminished to one third of the time that it remains in the sheep under ordinary circumstances, and causes it to be less fatal. In the worst cases, where it has been had recourse to, the deaths have seldom exceeded 10 per cent., and instances are mentioned where 350 have been inoculated and none of them have died; whilst in the case before alluded to (in 1847) the deaths were 80 per cent., and in Mr. Parry's flock they have already been as many as 25 per cent., his loss up to the present time being fully as great as that upon the whole of the sheep which have been affected.

There is not a farmer in Wiltshire who will not sympathise with Mr. Parry under such a trying visitation. Anything more disheartening we can scarcely conceive. At pre-

sent it is impossible to estimate the pecuniary loss which it will entail, and which is not simply confined to the number of deaths; for even the animals which have passed safely through the attack present such a weak and emaciated appearance as to render them quite unsaleable, and the subsequent care and attention which they will require to effect their perfect restoration will be considerable, and will be necessarily attended with great expense.

DEATH OF THE SHEPHERD.

Adding misfortune to misfortune, the poor old shepherd, who had tended the flock for the last thirty years, dropped down dead among his sheep last Thursday evening. Proud of his flock, which had always borne a high character and reflected credit upon his management, the poor man seemed to feel the visitation most acutely, and there is no doubt that the anxiety under which he had been labouring for the previous month, acting upon a diseased heart, tended to bring about his melancholy end. He was endeavouring to catch one of the sheep on Thursday evening, when he fell with the animal under him, and almost instantly expired.—*Devizes and Wiltshire Gazette.*

THE SARRACENIA PURPUREA :* A REMEDY FOR SMALLPOX.

By Fred. W. Morris, M.D., Physician of the Halifax Dispensary.

You have by this time, in all probability, heard something of an extraordinary discovery for the cure of smallpox, by the use of *Sarracenia purpurea,* or Indian Cup, a native plant of Nova Scotia. I would beg of you, however, to give full publicity to the astonishing fact that this same humble bog-plant of Nova Scotia is the remedy for smallpox in all its forms, in twelve hours after the patient has taken the medicine. It is also as curious as it is wonderful that, however alarming and numerous the eruptions, or confluent or frightful

* A communication from Mr. Herbert Miles, respecting this remedy, was read at a meeting of the Epidemiological Society, in the latter part of last year, and was noticed in this journal, vol. iii (2nd series), p. 323. Mr. Miles, who is assistant-surgeon to the Royal Artillery, was then quartered in Canada.—Ed. Ph. Journ.

they may be, the peculiar action of the medicine is such that very seldom is a scar left to tell the story of the disease.

I will not enter upon a physiological analysis now; it will be sufficient for my present purpose to state that it cures the disease as no other medicine does—not by stimulating functional reagency, but by actual contact with the virus in the blood, rendering it inert and harmless, and this I gather from the fact that if either vaccine or variolous matter be washed with the infusion of the Sarracenia, they are deprived of their contagious properties. The medicine, at the same time, is so mild to the taste that it may be mixed largely with tea or coffee, as I have done, and given to connoisseurs in these beverages to drink, without their being aware of the admixture.

Strange, however, to say, it is scarcely two years since science and the medical world were utterly ignorant of this great boon of Providence; and it would be dishonorable in me not to acknowledge that had it not been for the discretion of Mr. John Thomas Lane, of Lanespark, county Tipperary, Ireland, late of Her Majesty's Imperial Customs of Nova Scotia, to whom the Mecmac Indians had given the plant, the world would not now be in possession of the secret. No medical man before me had ever put this medicine upon trial, but in 1861, when the whole province of Nova Scotia was in a state of panic, and patients were dying in the hospitals at the rate of 12½ per cent., from May to August, Mr. Lane, in the month of May, placed the Sarracenia in my hands, to decide upon its merits; and after my trials then and since, I have been convinced of its astonishing efficacy.

The Indian cup is found in swamps and moss bogs. Its capacious globular receptacles are generally filled with cool, bland water. The cups are lined with bristles, pointing downwards, that entangle the flies that come to drink, so that few escape drowning. It is a very curious and remarkable family of plants, exclusively North American, and not to be met with west of the Alleghanies. The leaves take the form of a long bulbous tube or funnel, like the bowl of a tobacco pipe, terminatitg with a hood-shaped appendage, not unlike an Indian squaw's cap. The flowers, with their hard, involuted, crenate calyx, and fine sessile segments, like the yellow water-lily, deep-crimson stigmata, and corresponding stamina, in form and appearance are very remarkable. All of the tribe inhabit marshy grounds. The *Sarracenia purpurea* is the most common species, and, like all the beautiful things of Providence, widely diffused from Hudson's Bay to the Carolina Northern State. The root consists of numerous

short radicles, fibrous and stringy, which, when powdered, have a very faint and agreeable aroma, with a taste very like the willow alkaloid, or salicin. The dose of the medicine—the powdered root—is about a dessert-spoonful, simmered in a pint of water down to half a pint; this is divided into two doses, one taken immediately, the other in six hours; no sugar should be given with it. The only functional influence it seems to have is in promoting the flow of urine, which soon becomes limpid and abundant, and this is owing, perhaps, to the defecated poison or changed virus of the disease exclusively escaping through that channel. The Sarracenia I take reason is to believe a powerful antidote for all contagious diseases—lepra, measles, varicella, plague, contagious typhus, and even syphilis; also a remedy in jaundice. I am strongly inclined to think it will one day play an important part in all these.—*Amer. Med. Times.*

SULPHIDE OF ARSENIC IN COMMERCIAL SULPHIDE OF ANTIMONY.

By R. Reynolds, F.C.S.

A few months since I received a small quantity of powdered black antimony for analysis, being informed that several calves had died after its administration. The animals had been dead some weeks, so that the only sources of evidence were the medicine itself and such facts as had been observed with respect to symptoms. After reporting the analysis, the following outline of the case was supplied to me; but as it occurred at a distance, and I was not directly in communication with the owner of the calves, it is not quite so full as it might otherwise have been.

To each of twenty-four yearling calves was given one ounce of powdered black antimony, in a horn of urine. This was at 9 a.m., and the same evening one calf died, the whole of them being seriously ill. At varying intervals up to ten days further deaths occurred, until ten animals had succumbed. The others ultimately recovered. The symptoms were great cramp, constipation, and falling off of the hair. In two cases *post-mortem* examinations were made, and great irritation of the mucous coat of the stomach was found.

Analysis.—The powder was boiled with water, but neither arsenic nor any other matter was dissolved. To determine

if sulphide of arsenic was present, the process of Wackenroder was adopted (Fresenius). Twenty grammes are deflagrated with forty grammes of nitrate of potash and twenty grammes of carbonate of soda, by projecting the mixture gradually into a red-hot Hessian crucible. The resulting mass is lixiviated with water, filtered, the filtrate acidulated by hydrochloric acid and sulphurous acid added, after which sulphuretted hydrogen is passed through it. The moist precipitate is digested with carbonate of ammonia, filtered, acidulated, and precipitated as tersulphide of arsenic. This method is not rigidly accurate, as traces of either sulphide of antimony or of free sulphur may contribute to give too high results.

I give below the results obtained with four distinct specimens of sulphide of antimony:

No. 1	contained	sulphide of arsenic	1·33	per cent.
2	,,	,,	·27	,,
3	,,	,,	1·16	,,
4	,,	,,	·25	,,

Thus it appears that No. 1 (that given to the calves) contained far more arsenic than did some other specimens, amounting to 5·84 grains of tersulphide in an avoirdupois ounce, being the dose which proved fatal.

The dose of black antimony may be considered unreasonably large, but I know of no grounds for supposing that the antimony produced the mischief. Large doses of this substance are constantly given to animals. Pereira speaks of doses of two to four ounces being given to horses, and of half an ounce taken by a man for several days without bad effect.

It appears, then, that the arsenic present was the cause of mischief. The dose of pure sulphide of arsenic has not been determined, and it has often been regarded as comparatively inert. This is doubtless correct, as long as it retains its insoluble condition. *Medicina non agunt nisi soluta.* But, singularly enough, in selecting urine as a vehicle for dosing the calves, their owner was providing for the solution and prompt absorption of the sulphide of arsenic. When it was dissolved by the ammoniacal urine, its poisonous properties would probably be just as great as those of a similar quantity of arsenious acid in solution.

Gmelin gives a process for purifying commercial black antimony from arsenic, by digesting the powder with twice its weight of aqueous ammonia for forty-eight hours with stirring, then filtering, and washing the product, which is

almost entirely free from arsenic. This method may become of some practical importance. One of the principal makers of emetic tartar informs me that the black antimony lately in the market has been much more contaminated by arsenic than was formerly the case, and that it causes much trouble with the mother-liquors.

Impurity may exist to a much greater extent than that now recorded. Thus, Gmelin quotes Serullas to show that all German and French black antimony, excepting that of Montluçon, contains from 1·6 to 5 per cent. of arsenic.

It is evident that those who may unwittingly vend the contaminated samples incur the risk of being held responsible for results.

So long as sulphide of arsenic is present, and its noxious or innocuous quality depends upon the nature of the fluids which it meets with in the stomach, there will be a very disagreeable uncertainty about the use of the crude drug.

ON FERMENTATION AS A CAUSE OF VARIOUS DISEASES.

By M. Polli.

Chemists who have for several years been successfully studying the phenomena of fermentation have observed that this mode of reaction, among organic principles, possesses an importance much greater than is generally supposed. It is, in fact, to fermentation that the spontaneous decomposition of animal and vegetable tissues is owing, as dry-rot, eremacausis, gangrene, &c., and the whole series of successive transformations which organic matters undergo until they are converted into water, carbonic acid, ammonia, and mineral matters. It is by fermentation that fatty bodies give glycerine; that salicine furnishes glucose; that myronate of potash is converted into essential oil of mustard; that neutral substances, such as urea and allantoin, form ammonia; that amygdaline produces the poisonous substances, oil of bitter almonds and Prussic acid.

Ferments act by contact or by catalysis. Sometimes they are living creatures; sometimes very active unorganized substances. Diastase, emulsine, and pepsine act as ferments. They can cause organic substances to double, become hydrated, or isomeric.

According to M. Polli, there exists considerable analogy between the processes of fermentation and several organic

metamorphoses which take place in certain maladies; an albuminoid matter, which, in a certain deteriorated state, acts as a ferment, and particular substances proceeding from its action.*

But analogy is insufficient. It has been shown by carefully made experiments that the composition of the blood during disease undergoes alterations and variations, and that artificial disease, closely resembling natural ones, can be produced by introducing into the blood-vessels substances acting as ferments. Multiple abscesses, induced by injecting pus into the veins of dogs; septic affections, caused by the injection of purulent putrid matters into the veins of animals; diseases with all the characteristics of typhoid fever, provoked by the injection of putrefied blood into the circulating current; finally, contagious diseases, such as the glanders, which is produced by injecting glandered humours, prove that a general affection can be simply produced by introducing into the blood a substance to play the part of a ferment. There are diseases produced by morbific ferments, which may be called catalytic maladies, in which the morbific matter, inducing metamorphoses by contact with the alterable principles of the blood, is the primary cause of all the symptoms presented by the animal economy. It is impossible to deny that fermentation takes place in the blood.

Admitting that the starting-point of many diseases is the action of a specific ferment in the blood, is it possible to prevent its effects, to render it inactive in the living organism, as can be done by chemical means outside the body? This is the cardinal point which gives interest to this pathological question.

M. Polli believes that he has proved, by a series of facts and conclusive experiments, that it is possible to neutralise morbific ferments in the blood of animals by chemical substances which do not act in a manner incompatible with life; and that with these substances it is we must hope successfully to treat diseases of which fermentation is the primary cause.

It is well known that sulphurous acid gas prevents alcoholic and acetic fermentation, as well as the fermentation of animal matters and of organic matters in general. Thus it arrests, if it be already begun, the fermentation produced by

* M. Pasteur says that the ferment is not an albuminous matter altered by oxygen, but an organized creature, of which the germ is brought by the air; and that the presence of albuminous matter is a condition indispensable to all fermentation, because these substances are necessary for the development of the ferment.

saliva and diastase in contact with starch, the fermentation occasioned by myrocine in a paste of black mustard-flour, that produced by emulsine on the amygdaline of bitter almonds, &c.

M. Polli has proved that alkaline or earthy sulphites possess the same antiseptic and decolorising properties. This is an important fact, since it allows of the application of sulphurous acid in therapeutics. He thinks that he has grounds for believing that the action of sulphurous acid and sulphites on colouring matters, as well as on ferments, is not a deoxygenation, nor a combination nor destruction, but simply a molecular modification.

This action of sulphurous acid and sulphites affords an explanation of the valuable property possessed by these chemical compounds of preventing, or energetically arresting, the action of morbific ferments artificially introduced into the blood of animals, without altering its composition in a manner incompatible with life.

From a number of experiments on dogs, mentioned in his memoirs, M. Polli has determined the quantity of the safe and efficacious dose of sulphites for internal administration, the changes they undergo in the organism, and their curative action on affections produced by injecting putrid or contagious matters into the blood.

The following are some of his experiments, selected from those of the last-mentioned series:

1. Ten grains of sulphite of soda were given to dog in a space of five days, then one grain of pus was introduced into the femoral vein. The animal became spiritless and refused food, but its spirits returned the next day, and it ate willingly. The experiment repeated two days after yielded a like result. The animal was perfectly cured in a few days.

2. One gramme of pus was injected in two portions, into the veins of a dog more robust than the subject of the preceding experiment. The animal became dull, but ate the next day; the following day it was very low, the breathing difficult, the wounds sanious, the left leg and foot swelled, and it died ten days after.

3. An equal quantity of putrid blood was introduced into the veins of three dogs; one died five hours after, another after five days' illness, and the third, to which some sulphite of soda had been given, recovered rapidly after a little illness.

4. Numerous other experiments with putrid blood and glandered mucus prove that animals die with every symptom of general infection whenever sulphite of soda is not ad-

ministered, and that, on the contrary, they speedily recover under the influence of this medicament.

If these facts are confirmed by other experiments, M. Polli will have rendered an inestimable service to therapeutics, and will have thrown some light on the still obscure origin of numerous diseases.—*Chemical News.*

ON THE DETECTION OF ADULTERATIONS IN ESSENTIAL OILS.

From an article, by Dr. Bolley, in the *Journal de Pharmacie et de Chimie,* for the detection of adulterations in the essential oils, we extract the following:

"Among the substances most commonly employed for the purpose of adulteration are alcohol, fatty oils, and resinous matter; but volatile oils are also frequently employed, as oil of turpentine, rosemary, &c.

"I. Alcohol, when mixed in considerable proportion with essential oils, is easy to detect. It is only necessary to shake up the suspected substance with water in a graduated tube, and then let it remain quiet for some time. The true volume of the oil will be shown by the removal of the alcohol, whilst the bulk of the water is increased.

"M. Borsarelli proposes to pour the suspected oil into a graduated glass tube, and then to introduce gradually small pieces of perfectly dry chloride of calcium. The tube is then to be closed, placed in a water bath for four or five minutes, shaking it several times. The chloride of calcium dissolves in the alcohol and thereby diminishes the layer of oil. If the alcohol is only present in small quantity, the chloride merely becomes moist and pasty; if none is present, the salt remains dry and unchanged.

"M. Bernouilli, instead of chloride of calcium, proposes acetate of potash, which, employed in the same way, dissolves in the alcohol, but undergoes no change in pure essential oils.

"The presence of alcohol in essential oils may also be recognised by shaking them with olive oil, which dissolves them readily, leaving the alcohol floating on the surface.

"II. The presence of alcoholic soap is easily recognised by the froth which forms on shaking the oil. If an acid is added to it a fatty matter is precipitated, generally in the solid state, and the liquid on which the oil floats contains, in addition to the acid which has been added, the alkali removed from the soap.

"III. The fatty oils render essential oils rather thick, and facilitate the formation of air-bubbles on the surface. A pure essential oil mixed with eight times its weight of alcohol, sp. gr. 0·823, dissolves entirely, whilst the fat oil remains intact, and separates, provided it be not castor oil, which is soluble in alcohol.

"A fatty oil mixed with a volatile oil gives, when heated, a very definite stain on white paper, which is permanent.

"IV. An admixture of resin also communicates a stain to paper, but this stain is readily removed by alcohol, which does not affect the mark formed by a fatty oil.

"V. Those adulterations which consist in mixing essential oils with other essences of a less price, are often very difficult to detect.

"Lately, two reactions have been discovered which admit of the division of the volatile oils into two great groups.

"It is known that some contain no oxygen, but the greater number do contain that element; to determine to which of these groups a given oil belongs, Mr. Hope recommends the following plan to be adopted:—Precipitate a salt of copper with nitro-prusside of sodium, collect the precipitate on a filter, wash and dry it at 100° C. The precipitate is then used in very small proportion (a fragment about the size of a pin's head), which is mixed in a glass tube with a few drops of the oil to be tested, boil for a few minutes, and then allow it to stand. If the essential oil contains no oxygen, as, for instance, oil of turpentine, a green or greenish-blue precipitate will be observed, whilst the supernatant oil is colourless or slightly yellow. With oils which do contain oxygen, and which have not been mixed with other oils free from this element, the nitro-prusside of copper becomes black, gray, or brown, whilst the supernatant oil assumes a darker shade than in the first instance, becoming of a brownish-yellow or green colour.

"The essential oils of orange, citron, juniper, and of savin, behave like oil of turpentine.

"The essential oils of cumin, fennel, lavender, peppermint, balm, majoram, sage, absinthe, cajeput, sassafras, and rue, contain oxygen."

DR. HITCHMAN ON THE BREEDING OF STOCK.

J. Hitchman, Esq., M.D., chairman of the committee of the Derbyshire Agricultural Society, recently read an elaborate paper upon the "Breeding and Form of Stock" to the members of the society in the Lecture Hall. The lecture was admirably illustrated by a collection of drawings, to which frequent reference was made.

Dr. Hitchman commenced by noticing the increasing demand for meat on the one hand, and our diminishing resources on the other, and gave a few interesting statistics, showing the enormous demand for London alone. A gentleman wrote some time ago a brilliant article in the *Quarterly Review*, entitled "The London Commissariat." He made a careful calculation, that, supposing all the oxen required for a year to be coming along the Great North Road, and the sheep on the Western Road at the same time—and he himself on a pillar at Hyde Park—at ten abreast, the last animal of the herd of cattle would be seventy-two miles away, and the driver goading his shrinking flank considerably beyond Peterborough. And of the sheep, at ten abreast, on the Western Road, he says, "the shepherd at the end of the flock, and the dog that is worrying the last sheep, would be just leaving the environs of Bristol, 121 miles away, as the first ten would pass him at Hyde Park Corner."

This is the requirement of London alone, with its population of three millions, while there still remain 16,995,000 persons in other parts of England and Wales to be supplied by the British farmer, or his rival in other lands.

Dr. Hitchman then proceeded to point out, by the aid of his drawings, the strange changes brought about in breeding in the colour, form, and habits of the rock dove, the almond tumbler, the carrier pigeon, the pouter, the fantail, and adduced them as interesting facts, showing how an arbitrary and artificial standard had been resolved upon and realised and maintained. Again, aided by drawings, the lecturer graphically pointed out the great contrast between the head of Bakewell's long horns and M'Combie's polled or hornless cow, the mountain ram and the Leicester sheep, the Irish pig and the English sow, and other specimens, and stated that the tendency is *ever* to revert, to *go back* to the original form.

How have breeds been founded? Why has Charles Colling's "Hubback" (the grandsire of the bull "Comet"), picked up in a lane, or the "Godolphin Arabian" (the

maternal grandsire of "Eclipse"), purchased from a water-cart, become the fountain-head to which cattle breeders and horsemen desire to trace up the pedigrees of their stock? Why were they selected, but because they possessed, in a marked degree, most of the very best qualities which were desired in ox or horse, and because the purchasers believed and acted upon the idea that "like begets like;" and "*if* like begets like" in good qualities, why not in the bad? "Like begets like" in the bad equally, if not, indeed, more surely than in the good. Malformation in a vigorous animal is often handed down to *his* progeny for generations, even if none of his known ancestors possessed the fault; but it rolls on with fearful power if the defect *be* an hereditary one.

If the individual animal possess great vital energy, his characteristic form will be stamped on his progeny. Thus, in the 'Philosophical Transactions' of 1813, and in 'Thompson's Annals of Philosophy,' vol. ii, there is a description of a new variety of sheep as follows:—"Seth Wright, who possessed a small farm on the Charles River, about sixteen miles from Boston, had a small flock, consisting of fifteen ewes and one ram. One of these ewes, in 1791, produced a singular-shaped male lamb. Wight was advised to kill his former ram and keep this new one in place of it; the consequence was, the formation of a new breed of sheep, which gradually spread over a considerable part of New England, but the introduction of the Merino has nearly destroyed them again. This new variety was called the Otter, or 'Ankon' breed. They are remarkable for the shortness of their legs, and the crookedness of their fore legs, like an elbow. They are much more feeble and much smaller than the common sheep, and less able to break *over low fences;* and *this* was the reason of their being continued and propagated." This fact proves that an individual animal *starting* a defect may propagate this defect, although descended from a race without such peculiarity. Where, then, is the wisdom of selecting an animal which possesses few of the qualities we desire, but which comes before us with the magic of a name, and surrounded by the artificial halo of a pedigree?

As regards the form of the head, I attach great importance to a large wide forehead and a somewhat short face in all cattle intended for grazing purposes. There was a very fine specimen of a head in the yearling bull "Bushire 2nd," bred by Mr. Leeke, and sold for forty guineas at Mr. Cox's sale. The head of that young animal was a model, and, I was going to add, alone worth the sum for which the fine fellow was sold. Animals with the forehead wide between the eyes,

and expanding well out also in the upper portion of the skull, are more intelligent, and therefore more manageable than animals having narrow or convex heads. It is the index to coarseness everywhere, and often the index, too, of a bad constitution, what we should term rickety or scrofulous in the human subject. Size and strength are not identical in living tissues and structures; the small bones of the gazelle and the chamois, supporting them in dashing leaps from crag to crag, are natural illustrations of how strength may be condensed in the small bone; the large bones are full of cells, are porous, so to speak, and bear about the same relation to small bones as the branch of the pithy alder tree does to the dense and compact stem of the oak. It is pleasant to find very strong testimony on this point by one of the most successful graziers and cattle dealers that England has ever known. Mr. Culley, who realised a very large fortune by the purchase and sale of feeding stock, writes thus:—"For I aver that no large-boned animal will feed so quickly, or cover so readily and thickly with fat flesh, as one with a *small bone*, if well formed. This is the criterion—this is the main principle that we found our judgment upon respecting all animals which are to be fatted for the support of mankind; and we can justly say, that this judgment is confirmed by near forty years' experience."

Well, having for the most part dealt thus far with evil points, what may be considered good ones? In the bull, the head should be well set upon a broad, deep, muscular neck, the horns short, and not too bright; the ears long, and situated near to the head, the inside skin having an orange tint. The forehead should be broad at this point, with a somewhat concave appearance between the eyes, the eyes themselves large, mild, lustrous, and prominent. The butcher knows if he finds the eye of the calf protuberant, and by elevating the eyelids sees fat underneath, that the protuberance is caused by fat in the socket; and if it be found in quantity here, it is a fair criterion that it is well diffused in more important points. A fine flesh-coloured muzzle, with nostrils well dilated; the neck, as said before, broad, deep, and muscular; the shoulder-blades well set toward the rib behind, and yet stretching up finely towards the "crop," leaving no deep hollow between it and the ribs; chest deep; ribs well rounded, and stretching backwards to the hook-bone, so as to leave no very wide space there. The breadth *between* the "hook-bones" should be proportionate to the length *from* them to the point of the fleshy rump, and the tail set on as in the diagram; the fore legs should be broad and mus-

cular, from this point upwards; the thighs well developed, and touching each other inwardly, to near the hock; the skin covered with thick, soft, somewhat curly hair, and should be to the *touch*, when the animal is in a *store* condition, soft, elastic, and *pleasant* to the feel; but when the animal is fully fat (however soft the hair) the skin itself should be very firm, resistent to the pressure, like to the feel of a strained, well-distended air cushion. The bones should be as small as is compatible with the full, steady support of the animal. In the cow we everywhere expect greater roundness of form, a softer touch, wider hips, and a more delicate outline. In both a graceful carriage and lively air are desirable. Such I conceive to be the *perfect* animal. Some one has said, "the perfect *monster* the world never saw," but to this we aspire at our shows, and the "prize taker" is, or ought to be, the one which possesses the above points in the greatest perfection; however, practically, if there be a deep chest, a round rib, a broad loin, a mellow skin, and small bones, you have a beast which will repay your care, whatever faults may be found by the connoisseur in other parts of the animal's structure.

The lecturer then proceeded to consider what are the best principles of management. In other words, how we were to proceed to obtain animals of good colour, good form, prolific character, and sound constitutions, and condemned the system of breeding from young animals. And after a very interesting reference to the best colour of cattle, he said —I am as positive as I am of my own existence that a uniformity of colour, as unvaried as any other class of animals, could be secured in process of time, if breeders were unanimous in determining upon one of three, namely, red and white, pure white, or red. So long as *roan*, which is a *compound* colour, is determined upon, so long will it be a matter of the greatest possible uncertainty what the actual colour of the progeny may be. Certainly "roan" is a very beautiful colour, and the variety which it leads to makes a herd of "short horns," a most picturesque object in the parks or meadows of a nobleman; but still this variety detracts from its dignity as a tribe, and lessens its effect when viewed as a herd in the stalls or grouped for sale in the market. This uniformity may be effected, because even now there is a kind of unity amid all this variety, for if we cannot determine what the colour of the future calf will be, we can, at all events, predicate what it will *not be;* we know it will not be entirely *black*, or have any patch of that colour; black, or anything approaching black, would taint the fair fame of the short-horn, as assuredly as would a woolly scalp, a flat

nose, a protuberant lip, and a dark skin in her progeny, sully the honour of a Virginian lady.

Perhaps there have been more good short-horns of a white than of any other colour, although it is now very unpopular —unpopular, because it betrays dirt and it is difficult to keep unsullied; and erroneously unpopular, as implying weakness of constitution. It is as hardy as any colour. Stick to facts and not to fancies. In what colour does nature robe the animals which spend their lives amid the regions of eternal snow? What is the predominant colour in the Arctic hare, the Esquimaux dog, and the Polar bear? Of what colour are the body ends of nearly all feathers, especially the feathers of all water-fowl occupying cold latitudes? What colour has instinct and experience alike sanctioned as the proper one to husband and preserve the heat of the human body? Let no man condemn white colour in his ox as a sign of "nesh." A white cow may be "nesh," but the same cow would have been as "nesh," or "nesher," if she had been of any other colour.

After noticing the peculiar predominance of the characteristics of the male sex, he said that, coupled with another great truth, viz., the dominance of faculties impressed upon and handed down through several generations, it will be found to be true in the main that in crosses it is better to seek the "constitution" from the dam, and the quality and form from the sire, than the opposite. Referring to the custom of close breeding, which the lecturer thought had produced the best animals he had seen, the lecturer explained drawings of such animals and recounted the high value set upon them by eminent agriculturists. In forcible and eloquent terms Dr. Hitchman enforced a proposition that the Royal Society should furnish its members with accurate portraits of winners of the gold medals of the society, and passed on to point out that the great thing to be avoided is breeding from a diseased, deformed, or defective animal; a hereditary taint becomes by close breeding frightfully confirmed, and difficult to eradicate. The lecturer concluded by further enforcing the following propositions:

1. That man has been endowed with the means of controlling and modifying the forms of all animals.

2. That such modified forms can be handed down to the progeny, but, being departures from the primitive or natural type, the form can only be maintained by assiduous attention on the part of the breeder.

3. That not only because the qualities of the male can be immediately brought to bear upon larger numbers, but also

because of his own special endowments, it is best to seek for improvement of form and quality through him.

4. That qualities both of the form and also of the character become hereditary in proportion to the frequency of the repetition in past generations, but that it is dangerous to breed from any animal with important defects, however high its pedigree.

5. That healthful, well-formed animals, without hereditary taint, even if closely related, may be safely permitted to propagate their kind, provided the practice be not continued through many generations.

6. That young animals, for their first impregnation, should be placed to the best of their own kind, in order to avoid the reappearance of stain in any future progeny.

7. That science has not revealed any trustworthy arrangement by which the proportion of the sexes can be determined upon and secured.

THE ELAND.

Mr. Sclater, Secretary of the Zoological Society of London, reports most favorably of the acclimatization of the eland. "I think it can hardly be fairly said that the eland is long in attaining maturity, as in this respect it appears superior to the domestic ox. The eland is adult when a little more than two years old, and commences breeding at that period, which is certainly not the case with ordinary cattle until long past that age. Our elands produce their calves with great regularity every season, and each of the three females in this Society's gardens may now be seen accompanied by a young one. The male eland we now possess, which was bred by Lord Hill at Hawkstone, is a little over three years of age. As he is the father of two of the young elands above mentioned, the eldest of which was born in December last, and the female of this antelope goes nine months with young, it is evident that my statement as to the early maturity of this animal is correct in this case, and I believe it to be generally so."

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Annales de Médecine Vétérinaire, Bruxelles, Mai, 1862.

PUERPERAL APOPLEXY: ITS NATURE, CAUSES, AND TREATMENT, CURATIVE, AND PROPHYLACTIC, &c,

By Th. Vanderschueren, Médecin Vétérinaire du Gouvernement à Grammont.

This malady has been of frequent occurrence during the year 1861. It carries off every year great numbers of the best milch cows, which has for some time past drawn the attention of the author to it. The great number of cases that he has attended, and the many autopsies he has made, have enabled him to form an opinion as to its nature, &c.

Vitulary fever, commonly called droping after calving, puerpural or parturient apoplexy, is an affection of the milch cow, attacking her from the first to the third day after parturition, but seldom before.

This affection is so well known that it is needless to enumerate the symptoms. Formerly it only occurred in the stables of the small cultivators, where the cows were well cared for and fed mostly on cooked food—in a word, where everything tended to cause an abundant secretion of milk. From year to year this malady has become more frequent, and it now occurs in the sheds of the large farms, and has assumed a gravity which frightens the cultivators of the land.

The nature of this malady has been differently viewed by veterinary practitioners. It has been considered, one after the other, as metro-peritonitis, acute indigestion, a nervous affection, cerebral apoplexy, &c. This last view has the greatest number of partisans; nevertheless, this diversity of opinion is a sufficient proof that its nature is still involved in some mystery.

In a great number of cases the cadaveric researches have shown no lesion. Sometimes traces of inflammation are discovered in the peritoneum, the uterus, the intestines, and the lungs, but not enough to attribute to them the cause of death. Sometimes a clot of coagulated blood has been found by the author on the bulb of the spinal cord, but rarely those lesions which characterize cerebral apoplexy. These dif-

ferent results prevented him from adopting any of the above opinions, and, in conjunction with a great many practical facts, led him to view vitulary fever as a malady of the blood, which becomes infected during gestation, and the evolution of which takes place during the act of parturition in a great number of cases, but not in all. The author, having seen two cases in which the disease occurred before calving, considers this malady as an alteration of the blood; the great derangement of the different functions, the nervous disturbance, and, in a word, the whole of the alarming symptoms which are developed, seem to be the result of a reactionary movement of the animal economy, and to betray the presence of a morbid element in the circulating fluid. He says, the different terminations, or rather the metastatic phenomena, which I have observed in the course of this malady, are in favour of this opinion. I have several times seen the symptoms disappear and the malady give way to a secondary affection altogether different, which carried the animal off in a few days, just when there had been great hope of saving it. At other times the crisis has been an abundant secretion of urine, and it is the same when purging sets in. It is generally in the thorax where the metastasis takes place, involving the pleuræ, the lungs, and the pericardium. Sometimes all three become affected at once. Once only I have seen a case succumb to consecutive gastro-enteritis. These secondary affections always present themselves in a peculiar way. The invasion is occult, the progress slow, and they obstinately resist, as it were, all the curative means employed; the whole animal economy seemingly becoming undermined before one suspects it. The autopsy reveals in these cases profound alterations, such as vomica, false membranes, &c. But in many cases, where a cure has not been effected, the duration of the malady is too short to allow of this metastasis to take place, and the patient is carried off by the fever before there has been time for the morbid poison to fix itself on one particular organ. In such a case the autopsy reveals few or no lesions; this often happens. It is to be further observed that when the fever of reaction is not well defined, which is ascertained by a small, feeble, and but slightly accelerated pulse, the malady always terminates in death, the efforts of the animal economy being too weak to throw off the poison. If parturition is difficult, or the expulsion of the fœtal membranes does not take place, the malady is not much to be dreaded; and if by exception it declares itself, the manifestation of the symptoms is not so grave, and a cure is generally effected. Can this

peculiarity be explained by taking into account the irritation on the organs of generation consequent on the non-expulsion of the afterbirth, and the necessary manipulations resorted to in difficult parturitions? This irritation constituting a sort of revulsion, always followed by a sero-purulent suppuration, forming thus an *excrétoire* which eliminates the infecting principle. To him, the author says, of this there is no doubt, experience having sufficiently confirmed me in this opinion.

The *causes* of this affection are likewise little known; they are generally attributed to a plethoric state of the animal; but this is far from being indispensable to the appearance of it, for it has been observed in animals in middling condition only, and even in those who were in bad condition. On the other hand, if this circumstance were the only cause of the malady, would it not also prevail in the bad milkers? Experience proves, on the contrary, that, unfortunately, good milkers alone have this sad privilege. The author also asserts that he has never observed it in animals with their first calf, nor even in those with their second. It attacks only animals of a certain age, and when they have the greatest aptitude for the secretion of milk. We are, therefore, forced to admit a predisposition in the animal economy, the result of a peculiar organic disposition, and at the same time an abundant secretion of milk is, in a manner, the best qualification, and seems to be inseparable from the conditions which generate the evil. It has been before remarked that the malady is much more frequent now than formerly. This is perfectly in accordance with the improvement of the breed of cattle, and particularly with their milk-giving qualities. For this purpose cattle have been imported from Holland, which, in general, are good milkers, and if we consider that these imported animals are more subject to the malady, might we not attribute to them an ample share of the cause of the frequency of vitulary fever? Another point which has fixed the author's attention is that this malady is also greatly influenced by general causes, in the same manner as other diseases which affect the circulatory fluids; in fact, the number of cases in his district have surpassed greatly the average of former years; the disease has also been of a more acute form, as the greatest number of animals were carried off before the therapeutic means adopted had time to act. Several times he had observed this peculiarity where these general influences seemed to direct the course of the malady. Thus, in 1859 all the cases that occurred in the beginning of the year terminated favorably, while towards the end of the same year those attacked all died, although they had been

submitted to the same treatment. The great increase in the number of cases this year, as well as the greater number of fatal terminations, and the different results obtained in 1859 by the same curative agents in two different parts of the year—is all this to be attributed to the influence of general causes, or simply to chance? This question the author does not solve, but he leaves it to the consideration of other observers; he has merely given the particulars, in the hope that it may be more fully elucidated. In his opinion, abundant nutrition and a plethoric state of the animal favour, perhaps, the development of the disease; but these alone would not cause its development without some peculiar disposition existing in the animal economy, and its occurrence is for a certainty not indispensable, as we see some animals contract the disease when in middling and even bad condition.

Gestation is an indispensable condition to the genesis of the malady; parturition, in the majority of cases, is the determining cause. Finally, it is necessary that the animals should have attained a certain age to render them impressible to the disease.

The therapeutic agents recommended for this affection are numberless. This is a necessary consequence where the nature of a disease is so differently viewed. The failure of the greater number has led to the employment of other remedies, which has increased the number of prescriptions against this malady. I will not take the trouble to pass in review all that has been extolled in this respect, but confine myself to the purgative agent, sulphate of soda; the diuretic agent, nitre; and to emetic tartar, as being those agents from the use of which I have had the fewest failures, not forgetting venesection, whenever indicated. When, however, there is no fear of reaction, or very little, I have dispensed with it altogether. But this treatment is far from giving satisfactory results, as the malady, in spite of it, carries off every year great numbers of the best milch cows. The duration of the disease is generally too short for the therapeutic agents satisfactorily to act, besides which must be considered the complicated system of the organs of digestion in the ruminant, the general torpor and state of coma of the whole animal economy, and the cessation of the function of the digestive and the state of the urinary organs during the malady; so that one may easily conceive the reason why therapeutic agents, however powerful, are frequently without any beneficial effect.

The most efficacious treatment against this affection would perhaps be the preventive. Purgatives before parturition

have been employed with success by several practitioners, and I have also obtained good results from them. Diuretics have likewise been beneficially resorted to by me, and I do not know to which of the two to give the preference. The purgative should be given a couple of days before the expected parturition, so as to be able to repeat the dose in case the first has no effect. Diuretics are administered in small, repeated doses several times a day, from six to ten days before parturition. Venesection and dieting have, as preventives, given no satisfactory results.

The author concludes by giving a description of his most recent cases, which only tend to confirm his opinion.

First case, November 10th.—Vitulary fever (puerperal fever) declared itself in a middle-aged cow of the Dutch cross-breed. She was in middling condition; had calved the evening before without difficulty. Reactionary fever was very strong, in consequence of which she was bled from the jugular vein; a dose of sulphate of soda with emetic-tartar was given in a decoction of linseed, and repeated from hour to hour. Aloetic injections were thrown up, and dry clothing applied. On the 11th no perceptible change had taken place: coma more pronounced, and fever of reaction; the same agents ordered as before, every two hours; continue injections, &c. 12th.—Great amelioration; the torpor has entirely disappeared; the cow begins to feed; expulsion of a quantity of urine has taken place; but the violence of the pulse continues. The decoction of linseed to be given as before, likewise the injections. Towards night the animal got weaker, and succumbed about two o'clock the next morning. *Autopsy.*—The brain and its envelopes were perfectly intact; the pericardium exhibited traces of violent inflammation, but the interior of the heart was healthy. In the abdomen there was nothing abnormal, with the exception of the uterus, which presented traces of violent inflammation, and the cotyledons were in a state of gangrene.

Second case was a six-year-old cow, indigenous breed, very fat, an excellent milker; had calved the night before the last without difficulty; the pulse was very full and accelerated, but no decided coma. Venesection was resorted to to the amount of seven pounds, and the same medical treatment adopted as in the other case. On the following day great amelioration had taken place, and an abundant secretion of urine; an inclination to feed was manifested. The decoctions and injections were continued, and the same sloppy food was allowed. On the next day she was dismissed, cured.

Third case, on 11th of November, same day as the last

case. The subject of this case was a small cow, eighteen years old, in very low condition. She was in a state of profound coma, the pulse small and quick, reaction almost dull, the extremities cold. Administered the sulphate of soda and emetic tartar in decoctions of linseed, with aloetic injections every hour; dry clothing, setons in the dewlap. The animal died at midnight. *Autopsy.*—The brain and its envelopes perfectly healthy, likewise the thoracic and abdominal organs, with the exception of the uterus, which presented some traces of inflammation.

Recueil de Médecine Vétérinaire, Dec., 1861.

INOCULATION FOR CONTAGIOUS TYPHUS IN RUSSIA.

By M. L. Prangé.

Typhus in horned cattle is a disease very little known amongst us, but it is too important a malady for us to disregard the statements which reach us from time to time from those far countries where it prevails, generally in a most fatal, disastrous form. However, the course that has been pursued for some time, by inoculation, appears to lead to results still more favorable than those already obtained; and all cause us to hope that in future, as agriculture progresses and railways are multiplied, the number of victims carried off every year by this plague will decrease.

The inoculations made in 1857-8, on an estate of the Grand Duchess Helena, at Karlowscha, in the government of Pultowa, and which were directed by Veterinary Surgeon Raussach, have given very satisfactory results. Professor Jessen asserts that animals which have recovered of the typhus, whether attacked in the usual way or by inoculation, are generally preserved from a second attack, and those on which the inoculation has only produced external effects are likewise similarly preserved. In 1854 and 1855, at the veterinary establishment of Dorpat, some beneficial results were obtained from inoculation, but the malady thus transmitted was of so malignant a character that nearly all the animals died. Nearly the same results followed at the veterinary school, for out of nine individuals inoculated with the primitive virus seven died, one was cured, and on one the virus had no effect.

At Kazan the results were more favorable, with secondary virus taken from the first, second, third, fourth, and fifth ge-

nerations. Animals which were inoculated with virus from the sixth to the thirteenth generation, contracted the malady in so benign a form that none of them succumbed to it. These last experiments have proved that animals inoculated and cured could be introduced with impunity amongst the diseased herd.

The inoculations made at the farm of Hidirim, in 1853, have demonstrated that the virus from the second generation produces a benign form of the malady. Professor Jessen affirms that the inoculations practised in the different parts of new Russia have had a most favorable result, but that more to the north, that is, further from the original seat of the disease, it assumed a more malignant character, and that the losses from inoculation were more numerous. At the veterinary establishment of Charkoff, they inoculated in eight times, and in eight different districts, 1859 animals, from which they have been enabled to ascertain that the virus from the third generation produced a more benign malady; and, moreover, they acquired the conviction that those animals which had been effectually inoculated could with impunity mix with the infected herds. Of the above number only sixty died.

Professor Seifman, of the veterinary school at Warsaw, says that typhus is to be combated—1st, by a strict quarantine so as to prevent the ingress of infection, wherever it may be; 2nd, by the general slaughter of the infected and suspected animals: but this latter being only a palliative, the losses sustained by the different invasions of this terrible malady have been enormous. It was in consideration of these losses that in 1853, both in Poland and Russia, researches were made to ascertain whether inoculation would not to a certain extent be efficacious in preventing the evil. At the present time the expectations then raised seem well founded, according to a memoir by Serwieff, veterinary director of the medical department of the Ministry of the Interior.

The first experiments on inoculation were made in 1853, by order of the government, in the neighbourhood of Odessa, at the farm of Hidirim, by Professor Jessen, director of the veterinary school at Dorpat, and they have been continued ever since, without interruption, in different districts, viz., in new Russia, in the governments of Charkoff, Koursk, Kasan, Viatka, Mohileff, Livonia, Smolenski, and Kirgis. The object of these experiments was to solve the following questions:—1st. Are the animals of the genus *Bos*, liable to contract this malady once or several times in their lives? Experiments demonstrate that typhus only attacks them once. 2nd. Can the action of the virus be so weakened as that, when introduced, it will only provoke a feeble access of

the malady, which does not kill the animal so inoculated? Experiments have proved that the natural virus of typhus, passing from one subject to another, becomes gradually weaker, and that in the inoculated animal it produces a milder attack, which does not kill, and yet preserves it from contagion during the remainder of its life. 3rd. For how long a period will the virus conserve its contagious and preservative properties? This question has not been completely solved; there are, however, instances where it has preserved its contagious properties from six to eighteen months. These three questions being considered as the basis on which is founded the practice of inoculation, and having been solved almost completely, the Russian Government has recently authorised an establishment for the inoculation of typhus in cattle, one of which is in full activity near Odessa, in the government of Kerssan. In 1858 typhus caused great ravages amongst the cattle of Russia, which is shown by a report sent to the central government from all the provinces, these having a veterinary surgeon in every agricultural district, *not a medical practitioner*, for the investigation of epizootic diseases. There exists also in the Ministry of the Interior a directory of veterinary affairs, especially composed of veterinary surgeons. It is pleasant to think that a nation which is still considered as semi-barbarous should be one of the first to protect the practice of veterinary surgeons for the interest of agriculture. From these reports, the conclusions are that typhus is spontaneous only among the cattle of the Steppes, and for this reason all other parts of Europe might remain free from this terrible pest if only animals were exported which, either spontaneously or by inoculation, had had the malady. For this preservative operation we are indebted to Professor Jessen, who obtained by the generosity of the Grand Duchess Helena leave to farm an establishment for inoculating typhus in the governmento f Pultowa. Of fifty-three governments into which Russia is divided, forty-seven have been infected with typhus. In some of them it is proportionally more grave than in others; thus, in the government of Tscheewigow, there were 22,576 animals attacked, out of which 15,579 died. The governments of Tambow, Samara, Pultowa, and Orenburg, had 12,000 attacked, out of which two thirds died. The governments of Saratow, Mohilew Riasau, Orel, Vladmir, Peuza Bessarabia, Podalia, Valhynia, and Ukrania, had from 5000 to 6000 attacked, three fourths of which died. On the borders of the Steppes the mortality was only one half, on account of the improvements made in agriculture. It is in the basins of the large rivers, the Volga, Dan, Dnieper, and Dniester, which fall into

the Black or Caspian Sea, in a word in the Steppes, that the malady makes the greatest ravages. It was propagated northwards by the caravans which go from the Crimea to Siberia. The mortality was less by one half, while the animals attacked amounted only to a few thousands, in the governments of Perim, Wilnau, Vologda, and the Crimea. It was unknown in the governments of Finland and the Caucasus, but it penetrated into Siberia to beyond Toursk.

The report for the whole of the Russian Empire is 178,690 attacked, out of which 118,315 died. This loss is still considerable. The typhus appeared spontaneously in Bessarabia, Podolia, in the governments of Katarivoslow, Kiew, and Pultowa, that is to say, in the basins of the Dnieper and the Dniester; under the influence of unsettled weather, during the winter and spring, and more so after the melting of the snow, which was succeeded by great heat, the water being bad, and the forage scarce and of bad quality. It was also through contagion that the typhus declared itself in the governments of Vladimir, Penza, Tambow, Riazau, Toula, Moscow, Smolenska, Mobileff, Witebsk, Graduo, and Valhynia. It was likewise principally through the convoys of oxen which brought the contagion to the north, and for this reason it is hoped that, by the extension of railways, the danger will be lessened and the malady greatly diminished. The skins and other cadaveric remains have sometimes propagated the typhus, but, above all, the non-observance of the sanitary precautions and quarantine laws has been the great source of its spreading. The severity of winter and the stabling of the cattle, on the contrary, checked its progress in the government of Viatka. The typhus, although very intense on the borders of the Volga, was only spontaneous in a few localities; in others it was principally propagated by contagion through the tschomaches, which carry salt and fish from the Crimea, and which are drawn by oxen.

For some years there has prevailed in North America, particularly in the republics of Venezuela, New Grenada, and Colombia, an epizootic affection, which is vulgarly known by the name of delombadera, or derrengadera. It began at first by attacking the horned cattle in 1832, and committed great ravages until 1838; it then remained stationary, only to reappear in different localities with greater intensity, sometimes in one place and then in another, respecting, however, certain localities, where it was never known to have prevailed. This affection attacked indiscriminately all animals—young or old, weak or strong, or whatever might be their constitution, in certain localities; and, according to Veterinary

Surgeon Rodriguez, in a few days whole herds, containing from 1000 to 2000 heads of cattle, were destroyed by it. In 1857 it prevailed with great intensity. The Spanish veterinary surgeons consider it to be a malignant adynamic fever, and from the resemblance of the symptoms it appears to them to be the contagious typhus (*vide* 'Vet. Esp.,' Nos. 21, 23, 24, for 1860).

Whatever might be the case with this epizootic in America, as to its specific character, the spontaneous development in Russia of typhus seems not to depend so much on the nature and breed of the cattle as on the constitution of the soil of the Steppes; for in those districts where agriculture has made some progress the mortality is less. It is a well-known fact that in many parts of southern Russia the superior crust of the soil is formed of humus, which in some parts is two mètres in thickness; if, therefore, we consider that land thus constituted is naturally damp, and holds the wet for a very long time, and, moreover, that its proximity to the large rivers exposes it to frequent inundations, while sometimes the heat becomes suddenly excessive and very variable, we may easily conceive how very unhealthy these districts must be—Dombrutcha, for example, to cite only one instance. There is, besides, to add to the insalubrity of these marshes, an innumerable quantity of aquatic plants growing there, from which emanate, during the heat of an all but tropical sun on them, from some even while growing and from others when decaying, the most noxious and deleterious gases, notably carbonic oxide and the proto-carburetted hydrogen, recently so designated by M. Boussingault.

In the Steppes there are not the same conditions of vegetation, for they are nothing more than vast extents of uncultivated plains—in a word, barren heath and swamps, covered here and there with stunted vegetation, which grows miserably on land having an impermeable subsoil. These immense plains are, however, not altogether desert. There are here and there villages met with, it is true, but only a scanty population. Agriculture, however, for want of hands, does not extend far from these few centres of habitation. It is also well known that the cattle are kept constantly out of doors, without any shelter whatever. The result is that from the melting of the snow and the rain take place extensive inundations, which form large ponds and swamps, that remain for a certain time exposed to the great heat which supervenes. Under these conditions the water becomes decomposed, as well as the different substances in it, well-known gases become developed, and although less

abundant, perhaps, than those which are produced by the aquatic plants, may after a time act on the organization of the weaker animals, and finish by undermining the general health of the different herds of cattle whose fate it is to be constantly exposed to the influence of these emanations. It is, therefore, not surprising to see typhus decrease where the land is cultivated, and also wherever agriculture advances slowly, but progressively, penetrating more and more into the Steppes, thereby reducing their vast extent. The cultivation of those plants which require weeding by the frequent stirring of the soil are best calculated for most of these soils, while they contribute more efficaciously and more promptly than all others to neutralize the pestiferous action of the miasma which is set free from soils under certain circumstances. This is proved by the fact that when typhus is transferred by contagion into those governments where it never is known to occur spontaneously, the losses are always very great, because the cattle of these governments live under local terrestrial impressions absolutely different from those of the Steppes. It is thus that we find the typhus from the Crimea penetrate with the convoys of provisions into Siberia; and when thus contracted, even the cold, when at a very low degree, is not intense enough to stop it altogether, but only to lessen its ravages. The maize is the only weeding plant to which preference should be given for cultivation in these districts, for it also furnishes to man and cattle a wholesome and abundant nutriment when well cultivated. This cereal, so useful and interesting, is very easily gathered, and has, moreover, the advantage of permitting other plants to be grown between its rows. Those which are best adapted for this purpose are turnips, beetroot, cabbages, haricots, potatoes, peas, beans, and hemp. As the inhabitants of these districts are not much inclined to a vegetable diet, these products would be excellent food to fatten cattle and sheep, and thus become converted into animal food of a much better quality than the coarse meat which is sold for only fifteen centimes the kilogramme at Odessa at the present time.

As to the transmission of typhus by means of skins and other products into some of the governments of Russia, this is another reason for forbidding the exportation of skins, &c., of animals that have died of typhus beyond the limits of the Steppes. It is well known that hair, wool, skins, horns, &c., even after having crossed the sea, have after a time been capable of causing grave affections in those persons who had to handle them; for example, the hairs brought from Buenos

Ayres, the wool brought from Thessalia, and the serious accident which happened to a facchini (porter) at Genoa in 1851, after having carried the skins of horned cattle. This case, which is only cited here *en passant,* has, it is true, reference to another affection than that of the Steppes. But these instances of contagion by the skins, &c., of animals which have died of typhus and other contagious affections, do they not show clearly that the skins, even in their dried state, conserve the fatal property of propagating the malady during a certain time, which time cannot be determined with certainty, and which is not lessened by traversing the sea, as instanced by the above facts? The commerce of skins and other cadaveric products causes great inconvenience to those Russian governments in which the typhus never prevails except when introduced by contagion, either through the medium of the convoys of provisions or of the skins, &c. Tanned hides are without danger; but the exportation of hides, either raw or dried, with the hairs on, ought to be strictly prohibited from all parts where typhus is not indigenous. These reflections, which it would be useless to carry further, sufficiently show that the progress of agriculture, by narrowing the ring in those basins where typhus is of spontaneous development, and thereby improving their sanitary condition, would be to that country which furnishes for cattle only a scanty supply of provender, and which is besides of bad quality, a real benefit, and that inoculation is of useful application.

Veterinary Jurisprudence.

DEVON LAMMAS ASSIZE.

SHEEP WARRANTY CASE—THE COATHE.

ROUTLEY *v.* HOSKINS.

Council for plaintiff, Mr. Collier, Q.C., and Mr. Buller; attorney, Mr. Rowe. Council for defendant, Mr. Karslake, Q.C., and Mr. Kingdon; attorney, Mr. King.

This was a sheep warranty case.

The witnesses in this case, except the scientific ones, were ordered out of court. When this order was issued there was a general uprising of the persons in the body of the court, all of whom made towards the door.

His Lordship, looking at them, said—Are those all witnesses in this case?

Mr. Collier.—Yes, my lord, and it is not a pleasant prospect for us (laughter).

His Lordship.—No, indeed; it is a perfect mob of witnesses.

Mr. Collier.—Yes, my lord, that is the Devonshire for it; but the "mob" are my friend's witnesses, I believe (laughter).

Mr. Karslake.—Well, we shall see by and by.

Mr. Buller opened the pleadings. James Routley was the plaintiff and Henry Hoskins was the defendant. The declarations stated that the defendant, by warranting certain sheep to be sound, sold them to the plaintiff, but they were not sound, alleging also certain expenses. The defendant pleaded not guilty, and on that plea issue was joined.

Mr. Collier, Q.C., stated the case to the jury. He said that this case involved an inquiry into the intricate subject of sheep rot, which the jury would have to investigate that day. The plaintiff lived at Aldercombe Farm, Kilkhampton, Cornwall, and the defendant was a farmer of Boscastle. On the 22nd of November last the plaintiff bought twenty-four sheep of the defendant, at Boscastle Fair, and the question for the jury was, whether these sheep were sound or rotten at the time they were sold. The sheep were warranted to be sound at the time of the sale, and, as far as he (the learned counsel) could gather from the pleadings, the warranty was not denied. The facts were these:—The plaintiff went to Boscastle Fair on November 22nd, and he met the defendant's son, who showed him a number of ewes, for which he asked from 39s. to 40s. a-piece. The plaintiff offered 35s., and the deal ended in the plaintiff giving 37s. 6d. a-piece for a flock of twenty-four. Young Mr. Hoskins warranted them sound in every respect. Something was said about the danger of rot, and young Mr. Hoskins warranted them against that, saying that they had no rot in their part of the country. The plaintiff was satisfied with his bargain at the time, as the sheep appeared to be in tolerable condition, and they did not show any symptoms of being diseased. He trusted to the warranty, and gave directions to have them taken to his farm. They were taken that night to the farm of plaintiff's brother John, and the next day they were taken on to plaintiff's farm. Now he (the learned counsel) should show them, beyond all doubt, that the sheep were infected with rot, and if they were infected with the disease at the time they were sold, although none of the symptoms appeared at the time, yet the defendant would be liable to a breach of warranty. With respect to this disease of sheep rot, he (the learned counsel) would tell them what he could with the imperfect light he possessed. He understood that the disease was caused by an insect named the fluke. This insect was at first very minute, it grew gradually, and in the process of time it occupied the liver and various internal organs of the sheep. It fed on the sheep; as the insect waxed, the sheep waned; and at the last stage, if the sheep died or was killed, the flukes were found flourishing in the liver. Now he understood that it took some time for the fluke to develop itself so as to produce a sensibly bad effect on the sheep. A sheep might, therefore, be diseased of the fluke for a time and yet exhibit no signs of the disease up to a certain point. He was told that this disease was generally contracted in the summer. He had before him the opinion of Professor Simonds, of the Veterinary College, London. This writer said that, according to a common notion of farmers, the sheep caught the rot somewhere in the autumn, about August or September; but this writer thought that they were wrong, because they confounded the symptoms of the disease with the disease itself, because the symptoms did not generally manifest themselves until August or September; but he thought that the disease

was generally contracted in the summer. This view was the more probable, because it was known that insect life was more active and abundant in the heat of summer than at any other part of the year, and if this rot were caused by insects it was most likely to be set up in July or about the time of St. Swithin's day. In support of this, he was told that the disease was generally contracted after October, and never after November, and this again seemed likely, because they knew that as the cold approached insect life became inactive. He only meant that practically, if a sheep had not got the rot by the 1st of November, there was no danger of its catching it; but it was, of course, possible for the sheep to show the first signs of the disease after the 1st of November, the disease having been caught before. The learned counsel next described the symptoms of the disease. It was some time after the disease commenced that the symptoms appeared. The first sign of the sheep being affected was, he believed, its becoming weak and languid, and disinclined to move. If driving the sheep, it was difficult to get it along, as it would want to lie down. But even on those signs one could not say that the disease was the rot, because similar symptoms arose from other diseases than rot. The next signs were that the sheep's eye became dull, and the wool came out on touching it. He was told that at one period the effect of the disease was to make the sheep fatter, but subsequently it fell away, lost flesh, and became lean and gaunt. One sign of the disease was a swelling in the neck, called "oil bag." This explanation of the nature and symptoms of the disease was sufficient for the purpose of the present inquiry, and he proceeded to apply what he had stated to the particular sheep referred to in this case. They were bought on the 22nd November, and on the road to the plaintiff's farm they exhibited symptoms of disease. The driver stated that he had difficulty in getting them on; the plaintiff's men, on seeing them at the farm, did not like the appearance of them, as the sheep did not appear well. The plaintiff was not ready to believe that he had made a bad bargain, but rather thought the sheep were dull from travelling. After a few days a farmer named Elliott examined the sheep, and said that they were *coathed*, which was the provincial expression for rot. The plaintiff would not believe it then, but some time after, when the neighbours expressed their opinion, the plaintiff came at last to the conclusion that they were *coathed*. The plaintiff was occupied with other business, and having to go to Bristol, he directed his brother Matthew to communicate with the defendant on the subject of the sheep. Matthew neglected to do this, and on the plaintiff's return from Bristol he wrote a letter to defendant, on the 21st December, 1861. He sent it to his brother John to give it to the defendant. In that letter the plaintiff informed defendant that the sheep showed symptoms of rot, and wished him to come and look at them, as he (the plaintiff) should hold the defendant responsible for the warranty. The defendant received the letter at Boscastle market, and said in reply that the sheep were sound when he sold them, and that they must have been *coathed* since. This answer was, of course, the answer that might have been expected. The defendant did not, however, go to see the sheep. The symptoms that were discovered in them were such as to indicate that they had contracted the disease some six weeks or two months before. Finding that the defendant did not come to see the sheep, the plaintiff called in a veterinary surgeon, named Matthews, who looked at the sheep, and pronounced them rotten. On January 28th one of the sheep died; it was opened, and was found to be *coathed*. Flukes were in the liver. Two were killed, four died. On the 4th February the defendant

saw the sheep, and could not deny that they were *coathed*, but he said that they must have been *coathed* in the plaintiff's fields. Mr. Rowe, the plaintiff's attorney, wrote a letter to the defendant, suggesting that he should come to an arrangement with the plaintiff, but the defendant replied, through his son, that the sheep were sound when sold; that if plaintiff put the sheep on unsound keep, he (defendant) could not be responsible for the consequence. Another letter was received from the defendant, in which he said that he could prove that the plaintiff's farm was unhealthy from selling off all his sheep last year diseased. But the fact was that the plaintiff had not sold off all his sheep, and that he had not sold a single diseased sheep; all he sold were healthy. The plaintiff then sold the sheep by auction for 22s. 6d. each. Having kept the sheep for some weeks, they ought to have been worth 45s., and he brought his action for the difference, and some expenses. The learned counsel recapitulated the points of the case, and called his witnesses.

The *plaintiff* and the following witnesses were examined:—*Mr. John Routley*, plaintiff's brother; and *Mr. John Yelland*, plaintiff's shepherd; *Richard Batten*, the man who drove the sheep to Kilkhampton; *Mr. Elliott*, *Mr. Hopper*, *and Mr. W. Matthews*, farmer. *Mr. Gregory*, *M.R.C.V.S.*, Bideford, who had opened and examined some of the diseased sheep, said that the disease of *coathe* is generally contracted in the period between Midsummer and Michaelmas, or October. The disease must have existed three months to produce the flukes that I saw in the sheep. I think that the "oil bag" would not have shown itself in less than a month after the disease had been contracted.

(One of the witnesses had said that he noticed an "oil bag" in the neck of one of the sheep a month after they were bought.)

Cross-examined by *Mr. Karslake*.—He thought that the flukes had not been taken in by successive feedings of the sheep. He noticed that some of the flukes in the liver were larger than others, many being so minute that they could only be seen by the microscope. He was of opinion that the *pupa* of these flukes might have been taken by the sheep at the same time, and that some of them were developed earlier than others. This witness was examined by Mr. Karslake on the natural history of the entozoa, his theories being mostly founded on Professor Simonds' recent work on the fluke in sheep.

This closed the case for the plaintiff.

Mr. Karslake, Q.C., addressed the jury for the defence. He said that the defendant did not dispute that he gave a warranty that the sheep were sound at the time he sold them to the plaintiff. The case of the plaintiff was that they were evidently *coathed* very shortly after they were bought; but it was not till the 25th of December that the plaintiff informed the defendant that the sheep were diseased. This was inconsistent with the duty of a man who found that there was a breach of the warranty of the animals he had bought, inasmuch as it was for him to send back the animals to the seller directly he discovered that there had been a breach of warranty. In failing to do this at the earliest opportunity the plaintiff had put the defendant to disadvantage, because it prevented him from getting the best evidence to show that the sheep were diseased from something that occurred after the sale. In dealing with the probabilities of the case the learned counsel stated that he should produce evidence to show that the defendant had had his farm for twenty-nine years; that for this period he had never had a *coathed* sheep upon the farm; that he had taken thirty-six sheep to Boscastle fair for sale on the day in question; that the plaintiff again and again minutely examined those sheep and chose twenty-four of

them, which he bought; that those sheep had all been seen shortly before by competent judges, who would speak of their being healthy and strong to all appearance; and that the ten left out of the flock, sold at Boscastle fair, were sold to Mr. Chubb, a farmer, who had not lost a single one of those sheep by the *coathe*. If these facts were proved it would satisfy the jury that the sheep were not *coathed* when in the possession of the defendant. If so, they must have been diseased after they were bought, and to show that this was the case he would prove that the farm where the sheep lay the first night had *coathed* land on it, and that the plaintiff's own farm had *coathed* land. The learned counsel then called a number of witnesses, as follows:

Mr. William Hoskin, who saw the plaintiff examine the eyes of the sheep before he bought them; and said that not one of his father's flock from which the plaintiff's lot had been selected was *coathed*. The *defendant* stated evidence to similar effect, maintaining that his land had never been *coathed*. *Mr. Beal*, a farmer, examined the flock before they were sold, and observed that they were sound, to the best of his judgment. *Mr. Bray*, a sheep-breeder, said that, in his opinion, Carwithen farm was *coathed*. *Mr. Emmanuel Chubb* bought the ten sheep left of the defendant's flock after the plaintiff had bought his twenty-four; he found them all free from *coathe*. *Mr. Philip Braund* spoke to the unhealthy state of the plaintiff's farm, arising, as he said, from the heavy deadness of the land. *Thomas Ivy*, *Henry Cottle*, and *Mr. Braund*, having been examined, *Mr. Snell*, and his son, *Mr. W. Snell*, gave evidence. From their evidence it appeared that the elder Mr. Snell sent a flock of sheep which he had had a long time on his land to pasture at his son's farm near Hatherleigh. They were there ten days in November, and were slaughtered a month after, when full-sized flukes were found in their livers. But a ram which had not been sent with the sheep to the farm at Hatherleigh, and which was slaughtered at the same time as the sheep, was found free from *coathe*. This was a proof, as Mr. Karslake represented, that sheep could be *coathed* in November, and that flukes come to their full size in a month. *Mr. Jose*, a farmer and a neighbour of the defendant, said that the defendant's farm was free from *coathe*. This was the evidence for the defendant.

Mr. Karslake ably summed up the evidence for the defence.

Mr. Collier made a powerful reply on the whole evidence. He said that the defendant had made an attempt to stigmatise the plaintiff's land as *coathed*, but he said that a more abortive attempt to mislead the jury had never been made. The defendant had not proved that the plaintiff had ever had a rotten sheep on his farm, he being on his oath, that he never had. This miserable attempt recoiled on those who made it. Now, his learned friend pretended that the sheep were infected on the plaintiff's farm, but his learned friend was lifted with his own petard, because if the thirty-four sheep were *coathed* on the plaintiff's farm, how came it that the other sheep on the plaintiff's farm were alive and well? This was the best evidence that the sheep were not diseased on the plaintiff's farm. Touching the Hatherleigh case, of sheep *coathed* in November, the learned counsel said that he would not follow his learned friend into that case, because if they attempted to try that they should have been kept there all night; and, he added, that if his learned friend had felt himself strong on the Boscastle case, he would not have introduced the Hatherleigh case to the notice of the jury. (Laughter.)

Mr. Collier was proceeding with his address when the jury interrupted him by consulting. Mr. Collier ceased speaking, and then said that if

the jury were making up their minds against him he hoped that they would hear him out.

The jury continued to consult; after a short time the *Foreman* said—"We find a verdict for plaintiff."

Mr. Karslake said that he would ask his Lordship to stay execution, as he should move the Court above in this case.

His Lordship said that it would be better to proceed in the regular way, for Mr. Collier to finish his address, and for him (his Lordship) to sum up the evidence to the jury before their verdict was taken.

Mr. Collier said that he would not further occupy the time of the jury.

The learned *Judge* said—Gentlemen of the jury, this is a case entirely for your consideration; at the same time I think it is right, before you come to a verdict, that you should have the points and difficulties on the one side and the other set before you, so that you may give your verdict after due consideration of the whole case. No doubt the sheep which were the subject of the sale were diseased; in this case there was a sale under warranty, and no doubt they were diseased at least in January, but the question in the case is whether the disease under which they were then labouring was contracted before or after the sale. No doubt there are great difficulties on both sides, as it strikes me, and I will state to you what those difficulties are. The plaintiff's case is this. He says, I bought the sheep; they went to my brother's land for the night; it was healthy land; they then went to my farm, and there they were in Quarry Close, very healthy land, for four or five days, after which they were in plaintiff's farm with the rest of his flock, from that time till they were diseased, so manifestly that he was forced to sell them. The rest of the flock were healthy, and have been always healthy, and he says that it is utterly impossible to conceive how the sheep could have got the disease on his farm, because his other sheep, which were placed under the same circumstances, were all free from the disease. Again, he says, looking at the scientific evidence, it is plain that the disease must have been of long standing; he said, by the scientific witnesses, that the disease could not be contracted at the time of the year when the sheep were bought. These, I think, are the principal features in the plaintiff's case. But I must also say that on the defendant's side there are presented formidable difficulties in the way of the plaintiff's case, and I am bound to tell you the main features of the defendant's case. He tells us that those thirty-four sheep which were sold at Boscastle fair were taken promiscuously, as he calls it, from his flock, all mixed up together, and they were only picked out of the flock on the principle of taking all as near as possible of the same size, to avoid making an uneven lot for sale. Thirty-four of them having been taken out by selection for sale, the lot that remained behind on defendant's farm remained perfectly healthy from that time to this. Therefore there is a very great difficulty in saying how the sheep, the subjects of this action, could have been *couthed*. There, then, is a weaker feature in the defendant's case; weaker, I say, but yet comparatively strong, but not so strong as the first feature which I have noticed. You know that the defendant's theory is that those sheep were sound when he sold them, and that they caught the disease between the time they were sold and the time when the disease was discovered; and in proof of this, he says, not only did the flock which remained on the farm continue healthy, but also the lot of ten out of the thirty-four sold at Boscastle fair, and bought by Mr. Chubb, are all sound. This is a surprising fact, but on that it is said by the plaintiff that all those bought by Mr.

Chubb were two year olds, and they may have escaped the contagion which was fatal to their elder brethren. But I see a formidable difficulty here for the plaintiff's case. I have now told you the main points on the one side and the other. If, after what I have stated to you, you think it desirable, I will read to you the evidence on the one side and the other in support of the views that I have taken of the case, so that you may consider the case more fully. It is a matter entirely for you, thank God, and not for me, to determine the case, and having the difficulties laid before you, you will now please to consider them.

The jury deliberated for five minutes, and found a verdict for the plaintiff.

Mr. Kingdon.—I ask your Lordship to stay execution.

His Lordship.—Why?

Mr. Kingdon—We shall certainly move the Court above upon the case.

His Lordship.—But why should I stay execution?

Mr. Kingdon.—We wish the case to be reconsidered, because the defendant's character is challenged by the verdict.

The Foreman of the jury said that they did not impute any wrong motive whatever to the defendant.

Mr. Kingdon pressed his application.

His Lordship refused it, observing that he should have certainly told the Court above that it was entirely a question for the jury.

The Court rose at half-past six o'clock.

ARMY APPOINTMENTS.

War Office, Pall Mall, *Aug.* 8, 1862.

18th Hussars—Veterinary Surgeon John Mills, from the Royal Artillery, to be Veterinary Surgeon, *vice* Austin Cooper Shaw, who resigns.

Daniel Maclean, gent., to be Acting Veterinary Surgeon.

MISCELLANEA.

MUTILATION OF DOGS.

Every one who went to see the Dog Show at Islington must have been struck with the number of mutilated dogs which were exhibited, the mutilation chiefly consisting in the cropping of the ears. Sir Edwin Landseer, one of the judges, tried to establish the principle that all mutilated dogs should be excluded from the competition; and as he could not well press this without previous notice to exhibitors, he has suggested that at no future show shall dogs with cropped ears, or otherwise mutilated, be admitted.

ERRATUM IN NO. 416.

At p. 511, *for* R. S. Reynolds, Princes Risborough, Bucks, *read* Mansfield, Notts.

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Communications and Cases.

REMOVAL OF A SUPERNUMERARY LIMB FROM A THOROUGH-BRED FILLY.

By G. W. Varnell, Assistant-Professor, Royal Veterinary College.

In the *Veterinarian* for 1859, vol. xxxii, I published the particulars and results of an operation performed by me on a colt for the removal of a supernumerary leg. In the early part of August of the present year I performed a similar operation on a filly foal, the property of a gentleman at Newmarket, the results of which were quite as favorable as those of the former case. The operation, however, in the last instance was slightly modified from that of the former, and, I consider, with considerable advantage, which induces me, very briefly, to publish the particulars of the operation.

In this instance, as in the former case, the additional limb branched off from the inner and lower part of the large metacarpal bone of the near fore leg, below which it had the same number of articulations as the limb to which it was attached. In the former case I removed the limb by disarticulating the supernumerary leg at the fetlock-joint, and, although the case did as well as I then expected it could, nevertheless, for some days after the operation, there was a considerable discharge of synovia from the part of the synovial membrane left, which slightly retarded the healing process. This, however, was entirely obviated by the mode of amputation I adopted in the present case, which was as follows:—The filly being cast, and rendered insensible by the inhalation of chloroform, I proceeded to remove the extra limb, first by making a longitudinal incision on its inner aspect, from about

two and a half inches above the fetlock-joint to within a short distance of the lower end of the large pastern-bone, at which point I made a transverse one. These incisions being made, enabled me to reflect back, in a lateral direction, the soft structures from off the bones, by which procedure the branch of the metacarpal bone, and its appendages, were thoroughly exposed. I then amputated the limb about two inches above the fetlock-joint; which was effected in an oblique direction by a powerful pair of cutting bone forceps. The bone being divided, I had simply to dissect the detached portion from the main part of the limb, taking care in doing so, not to wound the capsular ligament of the fetlock-joint. It was necessary to place a ligature on each of the two arteries belonging to the detached leg, which being done, the flaps of common integument were brought over the surface of the wound, and secured by three sutures. Some damp lint was placed over the wound, and over it a light bandage, which completed the operation. No unfavorable circumstances took place in the healing of the wound, which at the present time is nearly cicatrized, and the filly is quite fit to leave the infirmary.

RUPTURE OF THE POSTERIOR VENA CAVA OF A HORSE.

By Assistant-Professor Varnell, &c.

As diseases of the blood-vessels of the horse, and especially the veins, are but seldom alluded to by contributors to veterinary literature, I am induced to publish the following case. It was forwarded to me by Mr. C. Page, M.R.C.V.S., and the course I am pursuing is with his sanction.

It is not my intention to enter into any lengthened dissertation on the causes which predispose veins to rupture, or upon what such lesions, when a predisposition exists, may immediately depend, but simply to record a fact, which may be available at some future time. Mr. Page's description of the case is as follows:

"Banbury; *August* 12, 1862.

"Dear Sir,—If not troubling you too much, will you be so kind as to give me your opinion as to the cause of a rupture of the vena cava, which occurred to a horse that I was called

in to make a *post-mortem* examination of this morning. I will give you the history of the case as short and as correct as I can.

"The subject was a hack horse, about fourteen years old; was never known to have had an attack of illness; had been regularly at work in harness up to his death, and for the last five weeks has been doing twenty miles daily.

"On Saturday last the man that was driving him fancied he was not quite up to the mark; took him to a farrier, who gave him some medicine, but could not make out what was the matter with him. On Sunday the horse went out as usual, and on Monday, when he was brought home at night, the man was noticed to be driving him rather fast through the town. After he had been in about twenty minutes he was taken to a stream to have his legs washed, but had not been there more than two or three minutes before he dropped down and died instantly.

"I made a *post-mortem* examination this morning, and found a rupture of the anterior vena cava, close to where it enters the right auricle. The heart was quite healthy, and also all the other organs. The stomach was quite full of food.

"From this imperfect description can you give me your opinion as to the cause of the rupture? Do you think over-exertion, and the horse not being well, had anything to do with it?

"I am, sir,

"Yours truly,

"CHARLES N. PAGE.

"To G. VARNELL, Esq."

My reply to the above letter was very brief, and the substance of what I stated is embodied in the following remarks:—We can hardly suppose that the rupture in the vein would have taken place had it not been either congenitally malformed or its coats in an abnormal condition. Such, however, may have been the case here, but was overlooked, as it easily might have been, in making the *post-mortem* examination.

We can hardly hope that such cases as the above will ever be diagnosed with any degree of certainty; nevertheless, by recording all that may come under our notice, with the history of what is known of the animals in which they occur, together with the symptoms observed immediately preceding death, and the *post-mortem* examination of the parts affected, would certainly afford useful data in forming future diagnoses; and

it is easy to conceive how very valuable such statistics would be in deciding cases in dispute.

I trust I shall not be considered presumptuous in suggesting a few points for consideration, when searching for the cause of similar lesions to the one in question. The age of the horse must be particularly borne in mind. If he is young, congenital peculiarities may be looked for; or if old, or even middle aged, the coats of the veins may be unnaturally thin, and brittle. Such an altered condition of their coats may also be accompanied with varicosity. The varix may be confined to one side of the vein only, which may arise from its inner lining membrane bulging out between the fibres of the muscular coat, this constituting hernia. Impediments to the free circulation of the blood near to the parts where the lesion may take place, or even remote from it, would predispose to such ruptures, and especially would this be the case if the coats of the vessels had been weakened by previous disease.

A long, interesting case of varicosity of the posterior vena cava was published in the *Veterinarian* for 1856, vol. xxxi, by Mr. W. A. Cox, of Ashbourne.

Such are some of the points which suggest themselves to me as being worth bearing in mind when looking for the cause of such lesions as the above.

VENTILATION.

A Paper read before the "Army Veterinary Medical Association," Aldershot, on Wednesday, August 27th, 1862.

By T. W. Mayer, Esq., M.R.C.V.S., V.S., R.A. Train.

Gentlemen,—In a paper which I had the honour to read before this association during our last session I endeavoured to show how the preservation of animal life had been promoted by the application of veterinary science, and stated that one of the most important means by which this desirable result had been obtained was by securing the quality, and regulating the quantity, of atmospheric air supplied, by a well-constituted system of ventilation.

By reference to certain calculations and experiments which have already been made in connection with this important subject, I endeavoured to demonstate that, although attempts had been made to establish in our stables a better system

of ventilation, that still much remained to be done; and that as yet no uniform plan had been suggested which would remedy existing defects, and secure in all cases, and under all circumstances, an aggregate supply of pure air.

Subsequent reflection has convinced me that no subject has a more intimate relation to animal life than this, nor is there one connected with the noble principles of our science that requires more consideration on our part of its principles, or careful discussion of its details, than ventilation.

I have therefore selected it as the subject for our consideration this evening, in the hope that our discussion may tend to confirm the adoption of some uniform system upon which it should be established.

Proper ventilation, as applied to stables, consists in the introduction of a sufficient quantity of pure air to keep up a due supply of oxygen which has become absorbed, and in the removal of that portion which has become vitiated or destroyed. To be perfect, it must be conducted upon strict scientific principles, formed by careful calculations as to the demand; the supply so regulated and applied in construction, that it can be tested with ease and accuracy.

Hence, the first important point for our consideration consists in ascertaining what is the quantity of air vitiated by a single horse, and what quantity will he require in a given time to keep him in a healthy condition.

To do this correctly I shall have to trespass on your attention for a short time, whilst I endeavour to give you an estimate of these quantities drawn from the recent investigations of human physiologists on this subject.

An ordinary healthy atmosphere has been stated to consist of the following constituents:

Oxygen . . .	19·7
Nitrogen	78·8
Aqueous vapour	1·4
Carbonic acid	0·1
	100·0

Any animal shut up in a close stable injures the purity of this air in those very matters which act injuriously to his health.

1st. He withdraws oxygen by the process of respiration, and thus diminishes its proportionate quantity.

2nd. He replaces the oxygen by an equivalent of carbonic acid, and thus increases the amount of that gas.

3rd. By the natural process of exhalation from the lungs and skin, he increases the proportion of water in the air.

Lastly. In the moisture so exhaled from the body there is a quantity of excreted animal matter disengaged from the system, which, were it retained, would be fatal to health and life.

The expired air, therefore, is found to differ very much in composition. It is stated to have lost from 4 to 6 per cent. of its oxygen, and to have acquired from 3·5 to 5 per cent. of carbonic acid gas in combination with ammonia and a large proportion of aqueous vapour, whilst the proportion of nitrogen varies but little, the quantity lost being very inconsiderable.

The quantity of air which passes through the lungs of man during ordinary respiration has been variously estimated, about twenty cubic inches being considered as the correct quantity.

But of this the lungs cannot be completely emptied even by the most violent muscular effort. The residual air has been calculated at from 40 to 260 cubic inches.

Philosophers of all times and of all nations have earnestly endeavoured to solve the problem of how much oxygen is consumed, and how much carbonic acid gas is given off, during the process of respiration. The results of their experiments are as varied as the attempts have been numerous.

Dr. Pickford, in his excellent work,* says—"Assuming that a healthy adult male respires twenty times in a minute, and takes into his lungs, at each inspiration, 20 cubic inches of air, he would inspire 400 cubic inches in a minute, 24,000 in an hour, or 576,000 in twenty-four hours."

Assuming, also, that the expired air contains 4 per cent. only of carbonic acid, he would evolve 16 cubic inches per minute, 960 per hour, 23,040 in the twenty-four hours = 3·529 grains, or 7 ounces 2 drachms 49 grains, of carbon.

Scharling who, has also recently investigated the subject, states that a powerful adult man exhales, in the course of twenty-four hours about 30·6 ounces of carbonic acid, which corresponds to 8·34 ounces of carbon.

If these calculations are correct, it follows that the horse (having five times the capacity of man) takes into his chest at each inspiration 100 cubic inches of air; allowing eight respirations per minute, he would inspire 800 cubic inches per minute, or 48,000 cubic inches in an hour; and if the expired air contains only 4 per cent. of carbonic acid (which is a low standard), 4800 cubic inches of that gas will have been produced in this space of time.

Faraday has somewhere stated that an adult human being

* Pickford, Dr., on 'Hygiene.'

evolves daily from the lungs no less than $13\frac{3}{4}$ ounces of carbon, a horse 79 ounces, and a milch cow 70 ounces. Upon what data the learned professor based these calculations, I know not. I should be inclined, from a consideration of the foregoing details, to fix the amount at about 45 ounces of carbon daily, and the quantity of carbonic acid generated during this space of time to amount to 24 cubic feet.

It must, however, be remembered that the excess of carbonic acid is not the only product injurious to health in a stable. The exhalations from the skin and excretions, also the walls and ceilings in certain conditions, or defective drainage, all aid in producing a vitiated atmosphere.

The maximum amount of the insensible cutaneous perspiration, including the pulmonary transpiration, has been estimated by Lavoisier and Sequin at 25·6 grammes troy per minute = 3 ounces 1 drachm 36 grains per hour, or 6 pounds 4 ounces 6 drachms 24 grains in twenty-four hours. The *minimum* quantity has been calculated at about one third this amount, viz., 8·8 grains per minute = 2 pounds 2 ounces 3 drachms 12 grains in twenty-four hours; and the *mean* at 18 grains per minute = 4 pounds 6 ounces.*

The pulmonary mucous membrane is said to average the amount of 3 grains per minute, or 9 ounces in twenty-four hours.

The insensible cutaneous transpiration may be said to average 8·8 grains per minute = 26 ounces 3 drachms 12 grains in twenty-four hours.

An atmosphere saturated with moisture interferes with the cutaneous and pulmonary exhalations. In dry weather both are increased twofold.

The sum of both secretions—the cutaneous and pulmonary—would amount to 2 pounds 11 ounces 3 drachms 12 grains in twenty-four hours.

In the horse, to about 14 pounds 9 ounces.

The animal matter held in solution by this exhaled fluid enters very readily into putrefaction after it is excreted from the body, and hence the moisture becomes a vehicle for a subtle aerial poison, which, when breathed for a sufficient length of time, poisons the blood through the lungs, and so predisposes to disease.

Thus, having established the following data—First, that a horse passes through his lungs 800 cubic inches of air per minute; secondly, that during twenty-four hours he will make 45 ounces of carbon, or 24 cubic feet of carbonic acid gas;

* Müller's 'Physiology,' and Dr. Pickford, on 'Hygiene.'

thirdly, that from his lungs and skin he will add to this about 14 pounds 9 ounces of aqueous secretion ; I think we may proceed on to a further consideration of the details mentioned in the introduction of this paper, viz., the quantity of air vitiated by a single horse, and the quantity required per diem to keep him in a healthy condition.

You are doubtless aware that of so much importance to the community at large has been the subject of ventilation considered, that a few years ago the attention of the legislature was directed to the matter.

Their discussions led to the appointment of a commission to inquire into the warming and ventilation of dwellings.

It would, however, be impossible for me in a paper like the present to do justice to their reports, or place before you the series of experiments by which they have been guided in their conclusions. They have proved themselves able pioneers in the cause of science, and all I can do is to follow the track they have traced, and show you how, from their observations, we may arrive at a sanitary regulation for the protection of those animals committed to our charge, and direct your attention to a few extracts from the reports themselves which contain matter bearing upon this portion of our subject.

In their remarks on the amount of fresh air required by a man, they state—

"We began the work by endeavouring to ascertain approximately the amount of fresh air required to keep a sleeping-room healthy. Various attempts have been made at different times to settle this amount scientifically, but nearly every experimenter has arrived at a different estimate of the quantity. These differences in opinion have arisen from not sufficiently considering the various offices already mentioned which fresh air has to perform in the ventilation of human dwellings, and from not looking at the practical rather than at the scientific side of the question."

"One set of experimenters have based their calculations on the quantity of air required to dilute the carbonic acid produced by respiration down to the proportion in which that gas exists in the external atmosphere. Other experimenters have taken the amount of air required to dissolve the aqueous vapour escaping from the skin and lungs; and to diffuse it so as to raise the hydrometric state of the air to the same healthy standard as that of the outer atmosphere."

"The estimates are hence very various, and differ to the extent of two, three, or four times, as to the amount of air required for health, a difference which proves how little is yet known scientifically on the subject."

They go on to say—"The practical argument as to the amount of fresh air required to ventilate a room is, in our opinion, of far more weight than the mere scientific one. We find, for example, that nature has provided in the atmosphere unlimited extent, and constant means of purification and of movement."

The building of dwellings interferes with those natural conditions, by enclosing the air in confined spaces, saturating that air with impurities, and rendering it stagnant. It may be fairly argued, as, indeed, has been proved by experience, that those dwellings are the most healthy in which the natural conditions of the atmosphere are most perfectly preserved."

Chemistry has told us distinctly enough that at least 200 cubic feet of air per hour is required by a human being for the mere purposes of diluting the carbonic acid and water given off from the body to the same standard as they exist in the atmosphere itself.

But chemistry takes no cognisance of those aerial poisons eliminated from the skin and lungs, and which in stagnant air are perfectly cognisable to the senses, even after the air has been diluted to the extent stated.

Indeed, *the object to be served by ventilation is primarily the dilution and removal of these poisonous exhalations; and if this be secured, the carbonic acid and water will be removed at the same time.**

It has been estimated by Doctor Arnott that each adult individual vitiates per minute by respiration 400 cubic inches of air, and by pulmonary and cutaneous transpiration three cubit feet.

A horse would therefore vitiate by respiration 2000 cubic inches, and by pulmonary and cutaneous transpirations fifteen cubic feet in the same space of time.

Fires, lamps, and candles, are calculated by Tredgold to deteriorate air at the rate of one fourth a cubic foot per minute for each individual; and, although the horse is not usually subject to this deterioration, yet the absence of a fire-place, the retention of fæcal and urinary matter in the stable, and the fact of his having to breathe again air which, owing to the ordinarily confined space in which he is placed is charged with carbonic acid, all add to the impurity of an atmosphere already vitiated; for the insalubrity of the air is in the ratio of the carbonic acid diffused through it. If this exceed a half per cent., the atmosphere, according to Leblanc and

* See 'General Report of the Commission appointed for Improving the Sanitary Condition of Barracks and Hospitals,' 1861.

Peelet, is positively injurious, not, however, from the mere deficiency of oxygen, but from the actual deleterious action of the carbonic acid gas.

Attempts have been made to calculate the number of cubic feet in space which are required for each individual, in order to maintain a healthy condition of the body. In private houses, especially in the bedrooms, each individual should have not less than 500 cubic feet. In civil and military hospitals it is from 1000 to 2000 cubic feet.

The result of the experiments of Her Majesty's Commissioners demonstrates that the minimum should not be less than 600 cubic feet, and that in a room containing a number of men the whole air of the room should be renewed at least twice in the hour. In other words, that each man should have, in round numbers, 1200 cubic feet of fresh air supplied to him per hour.

It is quite certain that hitherto no adequate provision has been made in our stables for the quantity of cubic space necessary for the health of its inhabitants.

Take, for instance, the stables at the cavalry barracks. The fourteen-horse stable contains about 13,983 cubic feet, a quantity barely sufficient for a similar number of men. The newly erected Horse Artillery stables have for sixty horses a space of 84,552 cubic feet or 1408 cubic feet per horse, a much larger space than the former, yet not much more than the allowance for a man in hospital. Again, the space per horse in the infirmary boxes, permanent barracks, is 2016 cubic feet, which, although again affording more space, is very little in excess over that granted to a patient in King's College Hospital, London.

Taking the whole of the foregoing facts into consideration, I have arrived at the conclusion that, where there are a number of horses together in any stable, it should contain a sufficient space, so as to appropriate 2500 cubic feet to each horse, and that no horse in a single stable should have less than 2000 cubic feet.

And when we further consider the large amount of deterioration this atmosphere sustains by respiration, cutaneous exhalation, pulmonary transpiration, evaporation of urine, retention of fæcal matter during certain periods of the day, and other concomitant evils, I think we may fairly assert that arrangements should be made whereby this atmosphere may be changed at least three times during the hour. The stable being so constructed that from 6000 to 8000 cubic feet of air per horse should quickly and regularly pass into the stable every hour.

The answers, then, to our preliminary questions, viz., What is the quantity of air vitiated by a single horse? and what quantity will he require in a given time to keep him in a healthy condition?—will be as follows:

By respiration, 2000 cubic inches per minute; pulmonary and cutaneous transpiration, fifteen cubic feet per minute; by other means, fæcal, urinary, &c., one cubic foot. That he also requires a space of not less than 2000 cubic feet, and the air of that changed not less than three times during the hour.

Pass we on now another step in our deliberations, and consider how this desirable result is to be obtained.

It has been proved by experience that all animals in their natural climate require very little more than food and shelter to preserve them in a healthy condition. As, however, it is considered that stables are absolutely necessary for their maintenance, it is requisite that we should consider how a proper system of ventilation in them is to be maintained.

It would, I think, be out of place, nor could I within the reasonable limits of a paper like the present present to you even a faint outline of the various plans that have been suggested and put into operation to carry out this great work. With many of them you are already well acquainted, and are probably convinced that our present system of ventilation is defective.

It will be better, therefore, if we confine our discussion to a few simple plans, necessary to ensure the amount of ventilation required.

It is a well-known fact that atmospheric air, like water, is governed by certain known laws, and that its ingress and egress into rooms and stables can be regulated by certain conditions. And it being now generally admitted that it is injurious to health to place any rooms or dwellings over stables, I shall assume, in the observations that I am about to make, there will be none.

The first question that arises is, how can the atmosphere rendered unfit for the purpose of respiration be resupplied, and how is the vitiated air to find an escape?

As is well explained by Dr. Pickford, respired air, being specifically lighter than pure, cold atmospheric air, ascends with the heated effluvia towards the ceilings and upper parts of dwelling rooms and sleeping apartments, where it becomes condensed and subsequently descends, commixes with, and contaminates equally, in accordance with the laws of diffusion of gases, the whole air of the room. A portion escapes by the upper part of the closed doors, and by the crevices and

openings between the window-frames and sashes, but by far the larger part is rapidly carried off by the flue of the chimney.

This is the most powerful ventilator of the room, and continually abstracts and removes a large stream of heated and vitiated air, sufficient to change the entire atmosphere of the room, provided there be an average amount of open doors, windows, and crevices, to yield a corresponding supply of pure air.

So, also, Her Majesty's Commissioners state that few persons are, perhaps, aware that an ordinary barrack fire-place removes a much larger amount of air than is merely required to dilute the carbonic acid and water to a healthy standard. The quantity varies, of course, with the section, height, and temperature of the chimney flue, and also with the force and direction of the wind. The extremes may be practically assumed at from 6000 cubic feet * per hour up to ten times that amount.

Again, fresh air enters by windows, doors, and crevices. It has been estimated that eight cubic feet of air will pass per minute between each window-frame and the sashes.

In the construction of stables it is, of course, necessary to have the usual appliances of doors and windows. But these should rather be considered as adjuncts to ventilation than part of the system itself. In any and every case the ample and free admission of fresh air, and the complete and ready escape of the contaminated atmosphere, which is all that can be desired or attained, should be self-acting. For even if we err, better that we err with too much than with too little pure air.

This self-acting ventilation may, we think, be established by the three following combined plans.

First, copious roof and ridge ventilators, with louver windows at the gables. This will allow of the heated air to escape.

Secondly, a number of openings under the eaves, admitting fresh air, and aiding in the promotion of free circulation.

Thirdly, the adoption of an intermural shaft of as great size as the thickness of the wall will permit, and intersected by a diaphragm, arising under the manger, about four courses of brick-work from the floor, and between every horse, each terminating externally above the roof. This would supply the place of a fire-place and chimney, furnish a large quantity of pure air in that part of the stable where it is most required,

* Enough for five men.

and replace that which will be fast making its escape through the openings in the ridge.

When a stable is newly erected this would admit of easy construction, otherwise the shafts would have to be made in a similar way to those in one of the stables of the 16th Lancers, but brought down below the manger instead of terminating at the ceiling. Should the horses' heads stand towards the centre of the building, without any other party wall, then I should suggest that they be constructed in the side walls.

By these means, in a given area, I believe the noxious matters would be carried away, and a due supply of fresh air admitted.

There are, however, times and seasons when any system of ventilation that we may adopt ceases to act, and air cannot be supplied without other adventitious aids. This is well known in mining districts, and what they call a "fight;" which prevents the men from working, and obliges them to light fires in the main shafts. We should simply say the ventilation was stagnant.

A similar result will explain several important facts ascertained by our president during a series of experiments carried out under his direction by First-class Veterinary Surgeon Collins.

By their kindness I am enabled to show you a copy of them on this sheet of paper, and whilst you will find circumstances detailed that in the perusal will strike your attention, you will also see how the different descriptions of ventilation seemed at certain periods to be passive, and at others acting in a contrary direction to what might have been anticipated. The whole tending to show that in those stables there is not sufficient area, that the intermural ventilation is deficient in capacity, and is, from construction, not self-acting, but requires the aid of open doors and windows, and that the whole require what may be termed a *circulatory medium.*

There is one circumstance connected with these experiments to which I wish particularly to direct your attention.

If you will compare the differences of temperature in the three troop stables mentioned, viz., The troop stable with the ordinary ventilation; 2. The troop stable with the eight ventilators; 3. The troop stable with two roof ventilators; you will see that in some instances there is no difference in the temperature between them, and in others a difference of three or four degrees.

This can only be accounted for by its bearing out the

experiments of Dr. Roscoe, who has shown that the beneficial action of the *brick-and-mortar walls* of our dwellings is not confined to the mere absorbing from or restoring moisture to the atmosphere, but that, it extends to a large, diffusive interchange between the carbonic acid gas of the apartments and the external atmosphere; that in fact, *brick walls* are powerful aids to ventilation. Dr. Roscoe ascertained that in a closed space, the air of which contained 16 per cent. of carbonic acid gas, 3·25 per cent. escaped in two hours through the solid brick.

In other words, the brick walls effected in No. 1 cavalry stable what the additional ventilators secured in the others.

Gentlemen, I might enlarge on this very interesting theme, but I am afraid that I have already trespassed too long on your attention.

Enough, I trust, has been shown to prove that a horse confined in a stable destroys rapidly so large a proportion of atmospheric air as to render it necessary that he should have a much larger cubic space than architects or builders have hitherto allotted to him; that the system of ventilation should be self-acting and of sufficient capacity, so as to enable the air of the stable to be changed three times during an hour; lastly, that the windows and doors should be looked upon as adjuncts to the self-acting system during times of extreme heat or stagnation in the outer temperature, and not as the main provisions for ventilation.

The evils attendant on the want of ventilation are only too well known amongst us. A very large number of the diseases attendant on horses, cattle, and sheep, can mainly be attributed to, or are promoted by, an accumulation and stagnation of the exhalations of the body.

If, therefore, man, in his provision for that part of the creation which administers to his wants, and furnishes him with his daily food, and contributes either to his amusement or sustains him in the day of battle, should possess any feelings of humanity, surely the least he can do is to give him air to sustain life as freely as light, with ingress and egress on all sides, and allow it to take its own course. Then may he exclaim with the poet—

> "What delight
> To back the flying steed, that challenges
> The wind for speed! seems native more of air
> Than earth! whose burden only lends him fire!
> Whose soul, in his task, turns labour into sport!
> Who makes our pastime his!"

ON SOME OF THE DISEASES OF THE STOMACH AND INTESTINES OF THE HORSE AND OTHER ANIMALS.

By Professor Brown, M.R.C.V.S.,
Royal Agricultural College, Cirencester.

(*Continued from p.* 327.)

Diarrhœa.

Notwithstanding the various forms under which this disease is seen, it consists essentially in the same condition of the intestinal canal. Various causes may be concerned in the production of this state, but in every instance, as a matter of necessity, there must be an increase in the fluid secretion from the lining membrane. Excess of fluid not only occasions a softening of the contents of the tube, but it also excites contraction by its mechanical action; and this explains the excessive evacuation which is the characteristic symptom of the disease.

The importance to be attached to diarrhœa will depend upon various circumstances; for example, the condition of the animal attacked, the extent of the morbid action, the causes in operation to produce it, and its complication with other diseases.

Some animals, as cattle and sheep, seem to suffer but little from diarrhœa, which does not continue for any length of time, while horses are seldom afflicted without serious sympathetic derangement. In these latter the disease is not one of common occurrence, and is always looked upon with some alarm unless it can be at once traced to something in the animal's diet.

Horses appear to be subject occasionally to a peculiar kind of diarrhœa, which may be termed acute; sudden in its occurrence, accompanied by a quick pulse, injection and heat of the membrane of the mouth, and sometimes by very violent abdominal pain; the evacuations are constant, liquid, and excessive in quantity; as a matter of course, the appetite is lost and the thirst extreme. Although generally and rapidly fatal, the malady will sometimes yield to sedatives given in gum or linseed emulsion, with counter-irritation to the abdomen.

Another form of diarrhœa in horses we have seen to arise from want of care subsequent to the administration of

repeated doses of calomel; in two cases we recollect where this agent had been employed daily for some time, the patients were incautiously taken out before they had quite recovered; and in both instances diarrhœa supervened, and destroyed them in a short time, seemingly from the exhausting effects of the evacuation, as in the one that was examined after death no indications of inflammation were present.

Cattle and sheep are frequently affected from very slight causes, and often suffer only a temporary inconvenience. The younger subjects, however, often succumb, and in certain seasons, particularly in some localities, the disease is extensively fatal—calves and lambs suffering especially from its ravages. In a chronic form, diarrhœa or dysentery is frequently present in cattle, producing extreme emaciation and serious organic derangement. In many instances we have found the liver extensively diseased, and the mucous membrane in a state of extreme irritation, variously coloured in patches, and marked by a general absence of its normal epithelium.

General characters of the disease.—The debility which results from diarrhœa is both rapid and decided, at least in those cases which may be termed acute; this debility cannot be explained by reference to the nutritive value of the expelled material, because the greater portion is merely dilute serum in conjunction with the effete solids. It is quite true that digestion is interrupted, and that whatever aliment is consumed is hurried through the digestive tube in such a manner as to prevent the proper appropriation of its elements; but the amount of prostration produced by a few hours' excessive evacuation is beyond all comparison greater than would follow a total abstinence for a much longer period.

Similar exhaustion, we are aware, would happen from loss of blood. This circumstance we are in the habit of explaining by taking into account the value of the fluid, but a little reflection will show that loss of nutriment cannot, of itself, occasion such immediate results. We are thus compelled to seek for a less exceptional argument.

Circulation we may assume to be dependent for its perfect performance upon a due supply of circulating fluid, which may offer sufficient resistance to the contracting heart and vessel; deficiency of quantity, irrespective of all other conditions, must lead to imperfect circulation, from the diminution of the elastic medium upon which the vessels may exert their force with effect, the same force being inoperative when expended upon a space only partly occupied by the elastic

fluid, as the greater part of the contractile force is obviously exerted upon the empty space before the fluid can be reached at all. A defective circulation, or even an entire suspension of the process, is easily explained by the simple fact of a sufficient amount of fluid to be influenced by the commencing contraction. Besides this, however, we may estimate as of considerable importance the absence of the distending force, which doubtless has much to do with the primary excitation of the functions of contractile tubes.

Debility, we cannot fail to perceive, is the inevitable consequence of any conditions of the organism which lead to diminution of the volume of the circulating fluid. In this way, diarrhœa being associated with the secretion of a large amount of the water of the blood in association with albumen in small quantities, and a considerable proportion of the saline constituents, causes an impaired circulation, by decreasing the bulk of the blood so much that the impelling force is wasted upon space, while the fluid remaining is so viscid, from deficiency of water and salts, that it would require more than ordinary energy in the circulatory system to ensure its equable distribution.

Another characteristic of diarrhœa is the altered condition of the evacuations, not only in quantity and consistence, but also in composition and colour, varying, as they do, from white to black.

The explanation of this fact is usually to be found in the nature of the food, or otherwise in the amount of the colouring matter of the bile secreted during the diseased action. In very young animals, living upon milk, the white dejections are consequent upon imperfect digestion of this fluid, and its premature expulsion from the stomach and intestines. When the food consists principally of herbage, similar derangement of function results in the evacuation of green feculent matter. Deficiency of biliary colouring will occasion a clay tint, while excess of it produces sometimes a perfectly black colour.

The composition of the evacuations will obviously depend upon the contents of the alimentary tube, but after a certain time the major part of the solid matter is removed, and nothing but the serous fluid, discoloured by washing over the intestinal membrane, and commingled with a little mucus, remains to be expelled.

General derangement of the secretions is another condition of the disease, not by any means remarkable when we consider the effects which must follow from the diminished volume and deteriorated state of the blood: thus dry and

harsh skin, with scanty and dark-coloured urine, are common indications of the state of the system. Whether or no the secretion from the intestinal membrane is acid, we are hardly justified in asserting, from the want of sufficiently numerous and exact data; but there can be no doubt of its possessing certain irritating properties which often keep up the diseased action after the original cause has ceased to act.

COMPOUND FRACTURE OF THE OCCIPITAL BONE.—RECOVERY.

By Richard H. Dyer, M.R.C.V.S., Waterford.

On the 28th of July last, an aged bay gelding, the property of a gentleman residing at Castletown, Carrick-on-Suir, was sent here for treatment. The history of the case is as follows:—Two days previously, the horse being at grass, he sometime during the night fell over a *sunk-fence*. The sunk-fence might be described thus:—two fields are divided by means of a masoned stone wall, the wall on one side being on a level with the field No. 1; on the other side, field No 2, is a large ditch, so as to prevent animals going from one field to the other; which, to my mind, is one of the most dangerous fences used in the country. Some persons, however, raise the wall a foot high, or a little more, so as more effectually to ward off ramblers.

The animal to which I have referred, fell over the wall into the ditch in the dark, and was unable to extricate himself therefrom. In his struggles he injured himself very much in several parts of the body, more especially along the course of the spine. But the principal seat of injury was the poll, where there was found to be a wound large enough to put in two fingers. The man in charge bled him, and as the horse became somewhat dull and listless, and a considerable amount of puffing was observed about the face and head, he thought proper to send him here, a distance of twelve miles, to have advice.

A careful examination of the wound enabled me to diagnose a fracture of the occipital crest, and the separation of the crest was so complete that one would have imagined it had been sawn through.

My prognosis was unfavorable. Taking into consideration the fact of the horse having struggled so much as to

cause a fracture of this part of the skull, which we know to be porous and yielding, led me to infer that much violence was necessary to produce the injury before me. And, further, the state of the head was extremely emphysematous. From these facts, together with an injury to the orbital arch on the left side, and other appearances that presented themselves, I could come to no other conclusion than that the issue of the case was doubtful; especially as I had seen many cases of a similar kind succumb, even after the most careful attention.

I explained the nature of the case to the parties interested, and the horse was left with me for treatment, which was commenced thus :—The head was tied up to a rack in a loose box, in such a manner that the animal could conveniently reach *soft* food, which was placed always before him, but only in very small quantities. A calico cloth was laid upon the poll, and kept wet with cold water. This course of treatment was continued during the months of July and August; with the exception of keeping the head up, this not being done for more than a week. On the 2nd of September the animal was sent home perfectly cured, and fit to be put to work.

This is one of those cases which require very great care and but *little* interference with. I am strongly of opinion that veterinary surgeons are often inclined to do too much in many of these cases. They are urged by the owners of horses to be always meddling. If we would have patience, and teach our clients the value of it and rest, we should, I am convinced, be conferring much comfort upon our poor suffering patients.

This case will, I trust, add another link to the chain of evidence which I endeavoured to bring before the profession on a former occasion, tending to prove that some fractures will recover under careful and judicious treatment.

SUSPECTED POISONING OF HORSES WITH SAVIN.

By C. Moir, V.S., Cardiff.

On the 12th of April last I was desired by J. B—, Esq., a large contractor, to go twenty-eight miles from here to examine a lot of horses which he had working there. On

my arrival I found that they had lost nine horses within a fortnight, seven of them dying within eight days, and two of them were then lying dead in the yard, awaiting a *post-mortem* examination. Some of the others were unable to work, and exhibited the same symptoms of disease as the others had done before they died. On reaching the stable, which is about a mile from the place where they work, I examined those animals that were unable to work, and all had the appearance of being under the influence of a narcotic, with the exception of one, a bay horse, eight or nine years old, in whom the symptoms were more marked than in any of the others: his coat was staring, his eyes sunk, and had a sort of vacant stare; his mouth clammy, and filled with a viscid saliva; the fæces were covered with slime; the secretion of urine was greatly increased; the pulse had a corded feel, and bounded beneath the fingers when pressed upon; there was also a watery discharge from the eyes and nostrils, but the respiration was not much increased.

My impression was that some poisonous agent had been administered, but as the manager and horsekeeper attributed the disease to working in a new heading, where the air was firy, I said nothing until I had made a *post-mortem* examination of the two that were lying dead.

Post-mortem appearances.—The mouth and internal coat of œsophagus inflamed, also the cuticular coat of the stomach; the mucous coat of the stomach and small intestines greatly inflamed, and covered with a slimy mucus; the stomach also contained an oily, greenish-yellow fluid, which from its strong disagreeable odour I knew to be caused by savin, although the horsekeeper at first denied having given anything to the animal with the exception of a little gruel. The kidneys contained a small quantity of pus, and were a little softened; the liver was pretty healthy in appearance.

Both cases had the same appearance, with the exception of the lungs, which in one animal were congested, in the other they were healthy.

On finding a good many of the symptoms of poisoning with savin, which was strengthened by the result of the *post-mortem* appearances, and also detecting that substance in the stomach, I came to the conclusion that death was caused by that agent. I therefore ordered a dose of medicine to be administered to those horses that were sick, and sent some tonic agent to be afterwards given, and all recovered with the exception of the one whose symptoms I have already described; he lingered about ten days, and then fell off again, notwithstanding all that could be done for him

in the way of dieting with linseed tea, bran mashes, mild tonics, &c.

The horsekeeper afterwards acknowledged that he had given a few tonics, and savin was one of the ingredients. On my asking for the recipe, he went to fetch it, but came back, saying he had lent it to the blacksmith, who was attending some other person's horses, but he produced one which he said was a prescription for cordial balls. Among the ingredients for this were oil of fern, salts of tartar (subcarbonate of potass), savin, some curious preparation of sulphur and antimony, and five or six other ingredients, of which I forget the names. He was dismissed without a moment's notice, and he sued Mr. B— for a month's wages, on the ground that he had been wrongfully dismissed. The judge, in summing up the case, told him that he had tried his experiments long enough, and Mr. B— was quite right in sending him off, as, according to the rate the horses were dying—nine in a fortnight—if he had kept him a month longer there might have been other eighteen dead.

"ON PROFESSIONAL AFFAIRS."

Dear Messrs. Editors.—Your leader in the last month's number on the subject of "Examination of Practitioners," will have been matter of no inconsiderable satisfaction to to those of your readers interested in the cause of veterinary science, the healthful complexion of your remarks contrasting agreeably with the languid aspect which has gradually been overspreading professional affairs lately. I have now been connected with the veterinary profession several years, which is my warrant for begging the indulgence of a little space in your next number for a few "facts and observations" that may, perhaps, just now be ruminated for the general good.

First, then, on the subject of examining practitioners with a view to conferring the advantage of admission as members of the Royal College of Veterinary Surgeons. There would assuredly exist among us no dissent from a kindly action being exercised to the advantage of another, did the question but resolve itself into individual circumstance; but in legislating for a community as ours there are other and higher duties to influence and constrain, too closely interwoven with good faith and obligation to all those of the past, of the present, and of the future, as connected with our profes-

sion, and urging the old adage of "being just before being generous."

If this principle of guidance be legitimate and proper, the matter now *sub judice* may be shorn of its difficulties, and the petition of each class of candidate as fairly and lawfully met. As regards *those practitioners who have never* graduated at a recognised school, and conformed to the general requirements at the time in force, there can be, *or should be*, but one decision—collegiate preparation being a *sine quâ non* to a member of the college. Then as to those who *have graduated, &c.*, if they have not presented themselves for examination at all, as appears to be the case with some, by all means should the doors be freely opened to them, so as to let them have their chance, and this on just such terms as all other candidates at the time being, whether of late or recent pupilage.

And in the case of those who, being *also qualified for examination*, have presented themselves, and, as one of the number in a recent communication to your Journal has piteously urged, *of course been plucked*, these should be afforded another opportunity to come up to the present standard, which, if we would move with the times, is certainly not of too formidable a character.

"Tempora mutantur et nos mutamur in illis."

In this way may the interests and claims of all be honorably responded to, otherwise a dangerous precedent would be established, and the premium rather held out to shortcoming than proficiency.

I further urge in argument, without fear of contradiction, how often is it felt among us that the veterinary profession is *not* moving with the times, is not making due advance, whether we view it in reference to its *status* in society or its scientific position. It is a disagreeable truth, but truth nevertheless, and one for the general weal which is far better looked boldly in the face than complacently passed by from time to time.

"Our remedies oft in ourselves do lie,
Which we ascribe to Heaven; the fated sky
Gives us free scope; only doth backward pull
Our slow designs when we ourselves are dull."

In thus drawing up a report of our case, the *clinique* would be incomplete and of little worth unless the cause of the ailment were investigated and a remedy prescribed, and I know of no better aid than that which we all understand by the term "comparative." We are in the habit of quoting

Vegetius, *ars veterinaria post medicinam secunda est*, but we should bear in mind a good *second* is not very much behind the *first;* but a second still may be many lengths behind and distanced, and there is no reason whatever that we should not run a very close race. That medical science has been, or is, standing still, none will attempt to assert, and therefore can we the better say, "Look on this picture, and on that!" and note the difference.

A few years since, it was deemed paramount that a candidate for examination should have served an apprenticeship of not less than three years to some member of the college, in regular practice during the whole of that period, and two sessional courses at a veterinary school should be attended; or, in lieu of the apprenticeship, *four* sessional years at one of the recognised colleges. And could any one conversant with facts quibble at an unecessary length of time? And yet, now-a-days, to compete with onward progress, when the education of the representative should be so much the more extended, the *required term* of study has again been docked to the fashion of olden time. The human branch of medical science has certainly not so acted, but rather found it necessary to impose fresh guarantees, and regulate by *preliminary* test individual efficiency to enter its ranks.

A very predisposing cause of ailment, then, in our branch of science must be traced to the gronndwork of the edifice, the superstructure of M.R.C.V.S. being at present raised in about a year and a half—not that actually, but two sessional periods—and the soundness of the foundation no longer aided by apprenticeship, to instruct in practical detail and manipulation, which can never otherwise be acquired. But worse than all, and here is the greatest evil, no solicitude whether the aspirant *has been educated in a manner* to comprehend a study so vast and intricate as that which medicine calls for, or to have disciplined his mind to that sense of refinement and honour essential to a gentleman and a member of our honorable profession. It may be replied, then, how is it that practitioners do exist to answer so nearly all the requirements which these desiderata would embody? And I think it will be found, in nearly every instance, that the education of the individual acknowledges advantages in addition to those afforded by his college training, many having enjoyed long insight through other sources of practice, and some having studied also in the human schools of medicine.

What an immense advantage if such attainments were compulsory rather than fortuitous. I would not for an instant be misinterpreted as insinuating aught against the

excellence of the educational arrangements in the veterinary schools; they may be unexceptionable as far as they go; but certainly if such a "curriculum" be requisite, *extending over several years*, to prepare a practitioner of human medicine, the veterinarian must obviously continue to run on unequal terms, and be content to get no better place.

Our remedy, to a great extent, is apparent, and the nearer we approach to *the standard of education* observed in our sister profession the better, the circumstances of each in a scientific point of view being so intimately allied. All of us experienced in the business of life know that great changes for a permanent good cannot always be accomplished suddenly, but there is no reason why we may not hope by rightly directed effort

"By slow degrees to reach ascension's height."

In further consideration of the remedy, there are doubtlessly more immediate collateral interests to be thought of and provided for. Probably under altered arrangements in the direction proposed, there might be for a year or two a less number of students, but this might, if need be, be met by increasing the entrance fee; for even if it were double the present amount it would be but about half of that required for matriculation at the hospitals. I am, however, not singular in prognosticating that the numbers even would *not be* found deficient, for with a higher scale of education, and, as a necessary result, *position*, must be the inducement to become students in even greater ratio, thus removing the *infra dig.* (imaginary or otherwise); and no doubt many a young gentleman would then embrace the veterinary profession whose associations now present the medical as being more favorable to his choice.

Another drawback also to our general cause in public estimation would promise also to be somewhat remedied, namely, by reducing a "class," and substituting men who for gain *need not*, and on principle *would not*, make horse-coping a seeming part of a veterinary surgeon's accomplishments; an attribute to him of very different character, be it understood, to the legitimate dealer in horses, in whom it is often not so difficult to recognise high principles.

If from these scattered suggestions accrue any good to the cause I advocate, I shall have the more reason to feel indebted to your courtesy in giving them a place.

Believe me, dear Messrs. Editors,

Yours faithfully,

M.R.C.V.S.

To the Editors of 'The Veterinarian.'

ON THE EXAMINATION OF PRACTITIONERS.

Gentlemen,—I happen to be one of those unfortunate wights, viz., an ungraduated veterinary surgeon, against whom "the powers that be" are waging a war to exterminate. I therefore hope you will allow me a space in your valuable Journal to make a few remarks.

I am one of those who have served an apprenticeship to a graduate of the Royal Veterinary College, afterwards I took the charge of a large stud of horses in England for a term of five years, at the expiration of which period I formed a partnership with a graduated veterinary surgeon in this country, and having after a time dissolved partnership, I commenced and have carried on an active practice on my own account for the last twenty years. I am not altogether unknown to the readers of your Journal, and reference has been made to my papers sent to that Journal by the late Mr. Percival and Mr. Gamgee. I have always acted so as to uphold the respectability of the profession, and I would ask, is it not a hard case that I should be compelled now to remove V.S. from my name? I would advocate as strongly as any one the necessity there is for a protection to the M.R.C.V.S.; but at the same time there should be some provision made, say the granting of a diploma, on payment of the fees and standing a practical examination, *to those only who have served an apprenticeship to a graduated veterinary surgeon, and who have been in practice for a certain number of years on their own account*, say ten or fifteen years. I think you would find that there are not a great number throughout the United Kingdom who would avail themselves of this arrangement. I know of only one in the north of Ireland besides myself, nor have I ever heard of another who had served an apprenticeship and was practising in any other part of Ireland; therefore, I think it would be an act of justice to a deserving class, who, from various causes, have been unable to finish their course of education (professional) by attendance at the Veterinary College, and having entered into practice, could not, without great loss, enter as pupils now.

I dare say that the number of those who have served an apprenticeship, and have been in practice the prescribed time, might be easily ascertained, through the members distributed over the United Kingdom.

Hoping the council of the Royal College of Veterinary Surgeons will adopt some such rule, and that, through your valuable Journal, you will advocate our claim,

I remain, Gentlemen, yours respectfully,

A Practitioner for Twenty-seven Years.

To the Editors of the 'Veterinarian.'

Facts and Observations.

THE GASTRIC JUICE.

Dr. Marcet is of opinion that the free acid of the stomach is the hydrochloric, since quantitative analysis of the amount of this acid, and of the bases present in the gastric juice, showed that there was more of it than was sufficient to combine with the bases. Nevertheless it is highly probable, he thinks, that other acids are present in a free state, especially the lactic, for on placing some gastric juice in a dialyser, and leaving it until all the hydrochloric acid had passed away, the remaining matter was found to be still acid.

The secretion of the gastric juice is at first abundant, but it gradually diminishes in quantity, and becomes more acid; probably in order that it might act on the less masticated or less easily digestible portions of the food. Before food is introduced into the stomach, the reaction of its contents is alkaline; this, however, is soon changed.

By the action of the gastric juice, albumenoid and other matters become converted into "peptone," which, according to Lehmann, might be viewed as the same body, whatever nitrogenized food is partaken of. But, besides this all-important change, another is effected by it, namely, the decomposition of the neutral fats, and the setting free of the fatty acids. This is necessary, since the bile will form an emulsion with a fatty acid, but not with a neutral fat. If such fat should escape decomposition, the pancreatic secretion forms an emulsion with it, which it does by incrusting each globule with a layer of soap, and this prevents the globules from coalescing, and increases their specific gravity.

PEPSINE.

This active principle of the gastric juice, still of questionable efficacy as a therapeutic agent, is stated to be now principally obtained from the stomachs of pigs.

"The anatomists of the school of Salerno," says the editor of the *Chemical News*, "in the absence of human 'subjects,' dissect the bodies of swine, 'as likest the human form divine;' and, according to some chemists, the gastric

juice of the same quadrupeds bears the nearest resemblance to that of man.

STATE OF IRON IN THE BLOOD.

It is the opinion of M. Fabri that iron exists in the blood in the form of albuminate of iron and soda. His reasons for this are, first, these three substances, by simple direct contact, form a soluble salt; secondly, their chemical combination is so powerful that it is not destroyed by the most delicate reagent for the metal, hence the necessity of interposing some body to effect the decomposition of the compound ere the existence of the iron can be demonstrated.

M. Fabri contends that in the various diseases for which iron is prescribed it would be judicious to administer it in the form of albuminate, this being the condition in which nature has placed it within our organism.

SUPPOSED ANTIDOTE FOR STRYCHNIA.

In a former number we recorded instances of arsenic proving the means of preventing death taking place from strychnia, such being the result of mere accident. We cannot see how such an agent can really be antidotal, unless it should be that an innocuous, or comparatively so, arsenical salt is formed by the union of the acid and the alkaloid. This is mere conjecture.

The following instance is somewhat similar.

A correspondent of the *Dublin Medical Press* writes:—"I was called to see a valuable pointer bitch, and found her lying in the stable perfectly stiff, with her head thrown back, and her mouth shut so fast that it required an iron bar to open it, and to bend a joint was impossible. It appeared that the dog had eaten a portion of a poisoned rabbit. I took about five grains of *turbeth mineral*, diffused in a little water, and with the assistance of two men got her mouth open, and succeeded in administering the drug. In about ten minutes the bitch opened her eyes, and shortly afterwards threw a quantity of fatty matter off her stomach; presently her limbs became pliable, and in about half an hour she was able to walk about, and was perfectly recovered in a short time."

ARSENICAL AND ANTIMONIAL SPECTRA.

Mr. W. Crookes, referring to metallic spectra, says:—"Unfortunately, I have not succeeded in obtaining any characteristic spectrum from arsenic in any of its compounds. A delicate spectrum test for this metal would be of the highest importance to toxicologists, but it appears, with the means I have employed to examine it, to give a continuous spectrum. Antimony, likewise, gives no better results."

TEST FOR THE PURITY OF CHLOROFORM.

M. Hardy states that, if a piece of sodium be thrown into chloroform and remain unattacked, the chloroform is pure. This is dependent on the fact, ascertained by Heintz, that the alkaline metals do not act on chloroform. But if it contain alcohol or other substances susceptible of alteration, certain gases are disengaged.

LONGEVITY OF THE HORSE.

The *Courrier de Verdun* mentions a rare instance of longevity in the equine race, M. Collas-Gattelet, member of the Council-General of the Meuse, having just lost a horse at the advanced age of forty-five.

LONGEVITY OF ANIMALS.

According to naturalists, the longevity of animals may be classified as follows:—Rabbits, 6 to 7 years; squirrels, 7 to 8; foxes, 14 to 15; cats, 15 to 16; dogs, 16 to 18 (that of Argus, the dog of Ulysses, mentioned in Homer, was 20); bears and wolves, 18 to 20; rhinoceroses, 20 to 22; fowls, 25 to 28; porpoises, 28 to 30; rooks and camels, 100; tortoises, 110; eagles, 120; swans, 160; elephants, 400; and whales, according to Cuvier, 1000 years.

ARSENIFEROUS SULPHUR.

A form of sulphur, according to Dr. Phipson, is found at Solfatara, near Naples, which contains a notable quantity of arsenic and selenium. It may be distinguished from ordinary sulphur by its colour, which is orange, and by being

only partially soluble in sulphide of carbon. When heated in a crucible, it almost entirely disappears, leaving only a slight trace of a blackish substance, which is insoluble in nitric acid, and gives the reaction of silica before the blowpipe.

Dr. Phipson gives the following analysis of it:

Sulphur	87·600
Arsenic	11·162
Selenium	0·264
	99·026

CARBONIC ACID AN ANÆSTHETIC.

We have long been of opinion that the action of anæsthetic agents depended upon carbonic acid being generated in the blood, all of them being rich in carbon. This appears to be confirmed by experiments performed by Dr. Ozonam, who states that, after forty trials with delicate animals, he had prolonged sleep in them for one or two hours at a time without accident, by means of diluted carbonic acid gas. He also operated upon a human being having a deep abscess in the thigh, without consciousness being evinced.

Dr. Ozonam claims for his method greater safety than belongs to chloroform, and states that consciousness is recovered as soon as the process of inhalation is suspended. Caution, however, is called for in the employment of diluted carbonic acid gas, as when it is mixed with atmospheric air beyond three or four per cent. it acts as a narcotic poison.

NEW METHOD OF OBTAINING IRON.

Mr. R. W. Sievier has invented a process for obtaining iron in a very pure state without "puddling." It is stated to be the reverse of the method usually adopted, for, instead of drawing a blast of air into the furnace, he withdraws that which is therein contained, by means of a fan of a peculiar construction; and as the atmosphere rushes in to fill the vacuum, the oxygen thereof has such an effect on the molten metal that the latter falls drop by drop, as a stiff, pasty fluid, which needs no puddling, and, accumulating at the bottom of the furnace, it may at once be submitted to the hammer and converted into wrought iron.

The puddlers and their companions have struck, alleging that the process will take the bread out of their mouths. A mistaken notion, too common with the labouring classes, since they forget the more an article is cheapened the greater will be its consumption, and thus labour will be promoted.

THE VETERINARIAN, OCTOBER 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

ON SPONTANEOUS GENERATION.

The generation of a living organism has been for ages a perplexing question to philosophers. Few of them are contented to refer the production of life to the "Great first Cause, least understood," and most of them *vainly* theorise on it; while some, finding its depth to be beyond the length of their short plumb-line, refer it to chance or "a fortuitous concurrence of atoms." Is it not strange that because man in his present imperfect state of existence is unable satisfactorily, by his reasoning powers merely, to account for the generation of even the lowest form of organization, he should not hesitate to ascribe it to accident or chance; which has been defined as being the atheist's creed in a monosyllable? He cannot see the order and design of the Creator's works, with whom small and great are terms unknown, for alike to Him are the movements of the insect's wing and the stately tread of the noble war-horse; the ponderous form of the leviathan of the mighty deep and the tiny polyp or microscopic infusoria—

> "To Him no high, no low, no rich, no poor;
> He fills, He bounds, connects, and equals all."

Well has it been said, "we call it chance in ignorance of the cause." We have been wont to say it is as easy to believe in the spontaneous generation of man as a monad, of the gnarled and knotted oak as the lowest conferva. If chance be the cause, how is it that each animal finds its most fitting habitat, high or low as it may be in the scale of existence? How is it that each has some means or organs for reproducing its own kind. According to M. Balbiani, even infusoria, like other animals, propagate at certain epochs with the aid of elements characterising sexual generation. These originate in the interior of organs known as the

nucleus and *nucleolus*. The first may be considered as the ovary, the second as the testicle of infusoria. Thus hermaphrodism is the general rule. Again, how is it that no new form or order of beings exists? Varieties there are in great numbers, but they are all referable to the original type. The axiom is doubtless true, "ex nihilo nihil fit." Is not the referring of the production of living organisms to "spontaneous generation" a mere cloak for our ignorance, and a barrier to all investigation? On the other hand, does this assumption in the least remove the mystery that is connected with the subject, or tend to draw aside the veil which enshrouds it? We trow not. Far more consistent and wiser it would be for man to express his inability to comprehend that which is so profound and mysterious.

So in reference to another division of science—for take whatever section you may, we can never reach its boundaries, however near we may approach them—it has been said that "human egotism has been at the bottom of many speculative errors, and man has too often tried to dwarf the universe so as to bring it within the limits of his feeble faculties, and make its operations correspond in brevity of duration with the shortness of his mortal life."

A universal diffusion of germs has been considered as a more feasible theory, and hence the saying, "omne vivum ex ovo." There may be some little difficulty in accounting for the first-deposited egg, but we know that it may remain unacted on for years until certain fit conditional circumstances cause the development of life from it; this we see in the soil that has not been upturned for ages, when plants of several kinds spring up, simply because the seeds have been subjected to the stimulating influence of the oxygen of the air and the heat of the sun, or perhaps its light, the truly invigorating principle.

It does not, of necessity, follow that the eggs are productive of the same forms as those animals by which they were deposited, since these may undergo many transformations ere they arrive at their perfect or mature stage of existence. Instances of this are so numerous, as seen in the batrachia and lepidoptera, as not to need their being

adduced. Is it not strange that a vermicule which attaches itself to a mouse should only arrive at maturity by transference to the tissues of a cat? It is also known that the echinococcus in pork, when eaten by dogs, gives rise to the tapeworm in that animal, and that segments of the last-named parasite will produce hydatids in the brain. In like manner the ovum of the fluke—*Distoma hepaticum*—does not find its way directly into the ducts of the liver of the sheep, but undergoes a change into the form of chrysalis or larva in the body of a fresh-water snail, or some small aquatic animalcule, the circular germ it sends forth being ciliated and capable of attaching itself to the bodies of these animals, and then penetrating them.

These observations have been evoked by the perusal of an interesting series of experiments instituted by M. Pasteur, and published by him in the *Comptes Rendus*, a translation of which appears in the *American Journal of Science*, by Dr. White. In his introductory remarks he says:

"The theory of spontaneous generation was long since proposed to account for the origin of beings whose germs were too minute or too obscure to attract attention. One after another the different organisms supposed to arise from spontaneous generation have been proved to originate from germs. At present the question of spontaneous generation concerns only the origin of *entozoa* and those minute organisms which can be studied only with the aid of the microscope, as moulds (minute fungi) and infusoria, both animal and vegetable. The common theory that the spores or germs of these minute organisms are constantly floating in the atmosphere, ready to start into activity whenever they meet with a suitable nidus has found an able advocate in M. Pasteur.

"In order to collect and examine the solid particles floating in the atmosphere, Pasteur placed soluble gun-cotton in a glass tube, and, by means of an aspirator, caused a current of atmospheric air to pass through it for several hours. The cotton was then dissolved in a mixture of alcohol and ether, and the atmospheric dust, deposited at the bottom of the fluid in a conical glass, was examined in the microscope. The sediment thus collected contained grains of starch and such other dust as is ordinarily found on surfaces exposed to the air. When submitted to the action of concentrated sulphuric acid, the starch was soon dissolved, while other

particles remained undissolved and had all the characteristics of the spores of ordinary mucedines, which are known to resist the solvent properties of concentrated sulphuric acid. [It is worthy of notice, that certain minute fungi are capable of decomposing a solution of sulphuric acid. A few years since, a little mould developed in the solution of sulphate of copper, used for electrotyping in the department of the U. S. Coast Survey at Washington, proved an intolerable nuisance. It decomposed the salt, assimilating the sulphuric acid, and rejecting the copper which was deposited around its threads in a metallic form. From this it appears that sulphuric acid does not prevent, but may rather assist the growth of certain fungi.—*Tr.*]

"To determine the action of atmospheric air, and of atmospheric dust upon fermentation, putrefaction and the appearance of organization, Pasteur adopted the following methods:

"A flask was about half filled with a fluid consisting of water containing in solution about ten per cent. of sugar and from two to seven parts in a thousand of the scum of beer. The neck of the flask was drawn out in the flame of a lamp and attached to a platinum tube, one twenty-fifth of an inch in diameter, which was then heated to redness. The fluid was boiled for two or three minutes to expel all air from the flask, when it was allowed to cool very gradually, and as it cooled the air which entered the flask was calcined, and all organic germs it contained were destroyed by passing through the red-hot platinum tube. When the flask had thus cooled to the temperature of the surrounding air, the neck was hermetically sealed. The flask was then removed to an oven, and kept at a temperature of 80° or 90° Fahr. for an indefinite period, without producing any organisms or undergoing any change whatever.

"To test the influence of atmospheric dust upon a fluid thus hermetically sealed, Pasteur placed a pledget of cotton or asbestos in a small tube, and caused a current of common air to pass through it by means of an aspirator. This small tube containing the cotton or asbestos, loaded with atmospheric dust, was then transferred to a larger T-shaped tube, one end of which was connected by india-rubber with the sealed flask, another end was connected with a platinum tube heated to redness, and the third being connected with an aspirator, the apparatus was easily charged with calcined air, and all the common air was expelled. The neck of the flask was then broken within the T-shaped tube, and the small tube containing the atmospheric dust was passed into the flask, with access only of calcined air. The neck of the

flask was then again hermetically sealed by means of the blow-pipe. Many flasks were prepared in this way, and in every case, after standing in a warm situation for twenty-four to thirty-six hours, vegetation appeared in the same manner as if the contents of the flask were exposed to the open air; but the mould, or mucedines, appeared first in the little tubes carrying the cotton, which was often thus filled to its extremities. The organic growths which appeared were the same as in flasks exposed to the open air,—viz., of infusoria, *bacterium;* of mucedines, the *penicilium, ascophora, aspergillus,* and some others. When calcined asbestos alone was introduced no vegetation appeared.

"It was thus demonstrated that amongst the dust suspended in ordinary air there are always organized corpuscles, and that these powders when mixed with a suitable liquid, in an atmosphere of itself inactive, give origin to *bacteria* and *mucedines* such as are furnished by the same liquid in the open air.

"Pasteur confirmed these results by another method. Similar quantities of the same fermentable liquid were introduced into a series of flasks in all respects alike. The necks of the flasks were all drawn out over the flame of a lamp, and bent into a variety of different forms, but the tubular neck of each flask was left with an opening one twenty-fifth of an inch or more in diameter. In some of the flasks the liquid was boiled for several minutes, but three or four were not heated to the boiling point. All the flasks were then set away in a quiet place, free from currents of air. After twenty-four or forty-eight hours, according to the temperature, the flasks in which the liquid was not boiled after being put into them (although all the liquid had been boiled before it was put into the flasks) were found to be troubled and covered little by little with mucor. The liquid which had been boiled in the flasks remained limpid, not only for days, but even for entire months, although all the flasks were left open. There can be no doubt that the curves and sinuous forms of the necks served to secure the contained fluid from the fall of germs.

"The common air entered these flasks as they were cooling, but so slowly during the gradual cooling of the hot liquid, that the germs were either destroyed by the heat or were deposited in the curvatures of the narrow necks of the flasks, so that no viable germs reached the liquid. When the neck of one of these flasks was broken off, and the remaining portion placed vertical, in a day or two the liquid became mouldy or filled with bacteria. This method, which so well explains the preceding, and which can be so readily practised

by any one, carries conviction to unprejudiced minds. It gives also peculiar interest to the proof which it presents to us, that there is nothing in the air except its dust, which is a condition of organization. It thus appears that oxygen acts only to sustain life furnished by germs, while of gas, fluids, electricity, magnetism, ozone, things known or unknown, there is nothing in the air except the germs which it carries which can originate organic life."

M. Pasteur proceeded in the same way with other fluids, as urine and milk, and in different localities—for it is not our intention to give all the details of those elaborate experiments—and found corresponding results to follow, and from the whole he considers the following to be satisfactorily demonstrated:

"1. That the air of inhabited places contains a greater relative number of fruitful germs than the air of uninhabited regions.

"2. That the ordinary air contains only here and there, without any continuity, the condition of the first existence of generations sometimes considered spontaneous. Here there are germs and there there are none.

"3. There are few or many, according to the localities. Rain diminishes the number; but after a succession of fine days they are more numerous. Where the atmosphere has been for a long time quiet germs are wanting, and putrefaction does not take place as in ordinary circumstances.

"Gay Lussac, Schwann, and Pouchet have performed various experiments upon liquids in contact with common air, with heated air, with artificial air, and with oxygen gas, using a mercurial bath to isolate the substances experimented upon. Some of their results have appeared to favour the theory of spontaneous generation. Pasteur has ascertained that mercury taken from the bath in any laboratory is itself loaded with organic germs. He took a globule of mercury, surrounded by an atmosphere of calcined air, and passed it into a flask of putrescible fluid by the process detailed in the former part of this paper. In every experiment of this kind after two days an abundant growth of organic products appeared.

"The same experiments were repeated with the same liquids, with no change of manipulation, with the same kind of mercury, except that the mercury was first heated to destroy the germs it contained, and no growths whatever appeared in the flasks.

"From all these experiments Pasteur concludes that powders suspended in the air are the exclusive origin, the first and necessary condition of life in infusions in putrescible bodies and in liquids capable of undergoing fermentation. It is easy to collect and observe with the microscope atmospheric dust, among which may always be found a great number of organized corpuscles which the experienced naturalist will distinguish as the germs of inferior organisms.

["Some infusoria are not more than $\frac{1}{24000}$th of an inch in diameter, and if we suppose that the ova of infusoria and the spores of minute fungi are no more than one tenth part the linear dimensions of the parent organism, there must be an incalculable amount of germs no larger than $\frac{1}{240000}$th or $\frac{1}{100000}$th of an inch in diameter. Since, according to Sullivant and Wormley, vision with the most powerful microscope is limited to objects of about $\frac{1}{80000}$th of an inch, we need not be surprised if infusoria and other organisms appear in putrescible liquids in far greater numbers than the germs in atmospheric dust visible by the aid of the microscope would lead us to expect.—*Tr.*]"

THE SMALL-POX OF SHEEP.

Since our last, the small-pox of sheep has made its appearance in Berkshire, but has not greatly extended in the neighbourhood of Devizes, where it originally broke out. Its extension has been due to the established traffic in sheep, which at this period of the year is more than ordinary in the western counties. Some lambs sold at Marlborough Fair, carried the malady with them, but by the promptness of all parties concerned in the sale, they were quickly returned home, and thus prevented doing an amount of mischief which otherwise must have followed their remaining in the locality to which they were sent.

Far be it from us to attempt to suppress a knowledge of the extent of the disease, but nevertheless we know, that compared with 1848 it is trifling indeed. Then we had to reckon the infected animals by thousands, now hundreds will suffice to express its amount. Then whole counties were affected, now only isolated spots in two or three counties at most.

It is satisfactory to know that the advocates of the spontaneous origin of the disease have little or no ground for their theory in its spread from the original site. Most of the facts can be easily accounted for, and we are not without hope that a satisfactory clue may yet be obtained to its appearance at Allington. The great questions of its suppression, and the lessening of its fatality, have been warmly discussed, and occupied the columns of both town and country newspapers. It is not difficult to see that party spirit, and professional rivalry, have exercised no small influence in these discussions. At the right time we intend to have our reply, being content for the present to let things remain as they are. We desire not to be sensation creators, nor to have our professional fame endangered by hasty conclusions. In 1848, we had to fight the great battle of *vaccination* as a preventive of *variola ovina,* now inoculation forms the ground of contention. The opponents of inoculation argue as though we cast aside everything else, and some would even take credit for advocating as a new discovery, the propriety of removal, isolation, or killing of infected animals. In our work on this disease published in 1848, we thus wrote: "the first thing which should be done is, to separate the infected from the apparently healthy sheep, and to place the latter at such a distance as to prevent the liability of their being contaminated by subsequent infection. Under no circumstances should this precaution be neglected, for various degrees of susceptibility to receive the poison exist among the animals, and consequently many may be saved an attack. These sheep should also be inspected daily, and any of them which show the slightest symptom of ill-health should forthwith be taken away. We cannot give a better proof of the advantage of such a proceeding than by adverting to the outbreak on Mr. Statham's farm,"—the original place of the appearance of the disease—"where, notwithstanding that all the sheep lived together for nearly a fortnight after the disease occurred, forty-three out of 256 escaped entirely by the rigid adoption of the above method."

The arrestation of the malady, however, does not rest at this time on individual exertions. The government has

taken the matter boldly in hand, and its prompt action will go far to prevent the serious losses which were sustained in 1847, and the subsequent years down to midsummer of 1850. An order in council, which we append, has been issued, and also the special attention of the Country Magistrates directed to the Act "*To prevent the spreading of contagious or infectious disorders among sheep, cattle, and other animals.*"

(From '*The London Gazette Extraordinary.*' Sept. 10.)

"At the Council Chamber, Whitehall, the 10th day of September, 1862, by the Lords of Her Majesty's Most Honourable Privy Council, present, the Duke of Somerset, Viscount Palmerston, and Sir Charles Wood, Bart.

"Whereas, by an Act passed in the Session of Parliament, held in the 11th and 12th years of Her Majesty's reign, intituled 'An Act to prevent, until the 1st day of September, 1850, and to the end of the then Session of Parliament, the spreading of contagious or infectious disorders among sheep, cattle, and other animals' (which Act has since been extended and continued in force until the 1st day of August, 1863, and to the end of the then next Session of Parliament), after reciting that 'a contagious or infectious disorder, known or described as the sheep pox, or variola ovina, now prevails among the sheep in some parts of the United Kingdom, and it is necessary to take measures to prevent such disorder from spreading,' it was and is enacted (among other things) as follows—namely:—'In case any sheep or lambs infected with or labouring under the said disorder, or any disorder of the like nature, be exposed or offered for sale, or be brought, or attempted to be brought, for the purpose of being so exposed or offered for sale in any market, fair, or other open or public place where other animals are commonly exposed for sale, then and in any such case it shall be lawful for any clerk or inspector, or other officer of such fair or market, or for any constable or policeman, or for any other person authorised by the mayor, or by any two justices of the peace having jurisdiction in the place, or for any person authorised or appointed by Her Majesty in Council, to seize the same, and to report such seizure to the mayor or any justice of the peace having jurisdiction in the place; and it shall be lawful for such mayor or justice either to restore the same, or to cause the same, together with any pens, hurdles, troughs, litter, hay, straw, or other articles which he may judge likely to have been infected thereby, to be forthwith destroyed or otherwise disposed of in such manner as he shall deem proper, or as may be directed in manner here-

inafter provided; and any person bringing or attempting to bring any sheep, lambs, oxen, bulls, cows, calves, or other horned cattle into any such market, fair, or open or public place as aforesaid, knowing such sheep, lambs, or cattle to be infected with or labouring under either of such disorders as aforesaid shall, upon conviction thereof, forfeit and pay for each and every such offence a sum not exceeding £20.'

"And whereas in and by the said Act it was and is further enacted as follows,—that is to say:—

"'If any person turn out, keep, or depasture any sheep or lambs infected with or labouring under the said disorder in or upon any forest, chase, wood, moor, marsh, heath, common, waste land, open field, roadside, or other undivided or unenclosed land, such person shall, on conviction thereof, forfeit and pay any sum not exceeding £20.'

"And whereas in and by the said Act it was and is further enacted (for the more effectually preventing the spreading of contagious or infectious diseases) as follows,—that is to say:

"'It shall be lawful for the Lords and others of Her Majesty's Privy Council, or any two or more of them, from time to time to make such orders and regulations as to them may seem necessary for the purpose of prohibiting or regulating the removal to or from such parts or places as they may designate in such order or orders, of sheep, cattle, horses, swine, or other animals, or of meat, skins, hides, horns, hoofs, or other parts of any animals, or of hay, straw, fodder, or other articles likely to propagate infection; and also for the purpose of purifying any yard, stable, outhouse, or other place, or any waggons, carts, carriages, or other vehicles; and also for the purpose of directing how any animals dying in a diseased state or any animals, parts of animals, or other things, seized under the provisions of this Act, are to be disposed of; and also for the purpose of causing notices to be given of the appearance of any disorder among sheep, cattle, or other animals, and to make any other orders or regulations for the purpose of giving effect to the provisions of this Act, and again to revoke, alter, or vary any such orders or regulations; and all provisions for any of the purposes aforesaid, in any such order or orders contained, shall have the like force and effect as if the same had been inserted in this Act; and all persons offending against the same shall for each and every offence forfeit and pay any sum not exceeding £20, or such smaller sum as the said Lords or others of Her Majesty's Privy Council may in any case by such order direct.'

"And whereas a contagious or infectious disorder, known or described as the sheep pox, or variola ovina, now prevails

among the sheep in some parts of the United Kingdom, and it is expedient to take measures for preventing such disorder from spreading.

"Now, therefore, the Lords of Her Majesty's Privy Council do hereby, in pursuance and exercise of the powers so vested in them as aforesaid, make and ordain the several orders and regulations following—that is to say:—

"'I.—It shall not be lawful for any person to remove any sheep or lambs to or from any or either of the parishes and tythings following, all lying and being in the county of Wilts, and near to the town of Devizes—that is to say, the parishes or tythings of Horton, Bishop's Cannings, Allcannings, Etchilhampton, and Allington, or to drive or conduct any sheep or lambs through or by way of such parishes or tythings, or any or either of them, unless the person so removing, driving, or conducting such sheep or lambs shall first have obtained a certificate, in writing, signed by some person who may have been authorised by two or more justices of the said county of Wilts to seize sheep or lambs infected with or labouring under the said disorders, under the 1st section of the said Act, that such removal, driving, or conducting may take place without danger of spreading the said disease.

"'All sheep and lambs dying in any of the stages of the said disease, whensoever such death or deaths shall or may occur, shall forthwith be buried by the person or persons in whose possession such sheep or lambs may be at the time of death, with their skins on, in pits of not less than five feet in depth, and the carcases so buried shall be covered with quicklime.

"'III.—All sheds and places whatsoever, and all railway trucks and other vehicles which may or shall have been used or occupied by sheep or lambs affected by the said disease, shall forthwith, after having been so used, be thoroughly cleansed with water, and immediately afterwards purified with chloride of lime by the person or persons in possession of such sheds, places, trucks, and vehicles respectively.

"'IV.—Every person in possession of any sheep or lambs in or among which the said disease shall manifest itself shall forthwith give notice, in writing, of the fact to the Chief Constable, or Superintendent of Police, of the county or borough in which such sheep or lambs may be.

"'V.—And it is further ordered that this order shall continue in force for three calendar months from and after the date hereof. "'ARTHUR HELPS.'"

In addition to the preceding, the following circular letter, addressed to the justices acting at —— (to be sent *in the meantime* to all Petty Sessions in the counties of Wilts, Hants, Dorset, Somerset, and Berks), has been issued from the Treasury:—

"WHITEHALL; *Sept.* 11.

"Gentlemen,—With reference to the disease now prevailing among sheep in certain districts in England, I am directed by Secretary Sir George Grey to call your immediate attention to the provisions of the Act 11th and 12th Victoria, cap. 107, sec. 1, and to the fact that the Statute in question is still in full operation, having been continued by subsequent Acts, and ultimately by the 21st and 22nd Victoria, cap. 22, until the 3rd of August, 1863, and the end of the then next Session; and I am to add that, in the opinion of Sir George Grey, it would be highly expedient for two of the justices of the county to appoint, without delay, a person well acquainted with the subject to attend at the markets and fairs about to be held for the sale of sheep or lambs within your county, for the purpose of executing the powers conferred upon a person so appointed by the 1st section of the Act above mentioned.

"I am, Gentlemen,
"Your obedient Servant,
"H. WADDINGTON."

Also the following circular letter, addressed to the Mayor of —— (to be sent *at the present time* to boroughs in the counties of Wilts, Hants, Dorset, Somerset, and Berks), has been issued from the Treasury:—

"WHITEHALL; *Sept.* 11.

"Sir,—With reference to the disease now prevailing among sheep in certain districts in England, I am directed by Secretary Sir George Grey to call your immediate attention to the provisions of the Act 11th and 12th Victoria, cap. 107, sec. 1, and to the fact that the statute in question is still in full operation, having been continued by subsequent Acts, and ultimately by the 21st and 22nd Victoria, cap. 22, until the 3rd August. 1863, and the end of the then next Session, and I am to add that, in the opinion of Sir George Grey, it would be extremely expedient for you to appoint, without delay, a person well acquainted with the subject to attend at the markets and fairs about to be held for the sale of sheep or lambs within your borough, for the purpose of executing

the powers conferred upon a person so appointed by the first section of the Act above mentioned.

"I am, Sir,
"Your obedient servant,
"H. WADDINGTON."

With the insertion of these official documents we close our present remarks, only stating, in addition, that which many of our readers will be pleased to learn, *namely*, that Professor Simonds has been specially commissioned by the Government to enquire into the origin, extent, and the best means of preventing the further extension of the small-pox among the sheep.

Extracts from British and Foreign Journals.

THE ORIGIN AND TRANSFORMATION OF ANIMALS.

[WE extract the following paper from that interesting serial, the *Intellectual Observer*, as it bears upon a subject we have ventured to take up in the present number, and has our full concurrence.]

During the years 1855 and 1856 M. Quatrefages published a series of articles in the *Revue des Deux-Mondes*, which he has now elaborated into a book entitled 'Métamorphose de l'Homme et des Animaux;' and as this work deals in a succinct and agreeable form with questions of great interest, we propose in this paper to give an account of the principal results which are set forth in its pages. In distinct opposition to the school of Heterogenists—represented in France by M. Pouchet and in England by Dr. Grant—M. Quatrefages adheres to the maxim of the illustrious Harvey, *Omne vivum ex ovo*—"Every living being from an egg;" and all the cases of eggless production he treats as phenomena of individual growth, assembling the entire group under the new-fangled and not very happy designation of *Geneagenesis*, or the "Generation of Generations." "Every living being," he says, "and consequently every animal, comes from a germ. With the organization of this germ commences a series of

transformations, general or partial, rapid or slow, and which only terminate with its life." All animals likewise undergo transformations, which, considered radically, "are due to the same cause, and are effected by the same methods." The germs or first rudiments of living things may be referred to three types. Animals multiply by eggs and by buds, which are either permanent or "caducous."* The egg method may be regarded as "fundamental, and the distinction between oviparous and viviparous species, although still admitted in scientific phraseology, is in reality only nominal. Baër, in discovering the egg of the mammalia, M. Coste, in demonstrating that this egg possesses the same parts as the egg of birds, have established this fact, which has been put out of doubt by the profound researches of those two naturalists and by the admirable labours of English and German physiologists, Barry, Bernhardt, Bischoff, Wharton Jones, Valentin, Wagner, &c. It is now plainly demonstrated that the mammalia, including man himself, spring, like birds and reptiles, from veritable eggs."

Here the question arises, What is an egg? M. Quatrefages answers, "Three spheres enclosed one in the other and contained in a transparent membrane, constitute the germ." The egg may differ in accessories, but "we always find in the vitelline membrane the vitellus, or yolk, enveloping the *germinative vesicle of Purkinje,* which itself includes the *germinating spot* of Wagner. The precise functions of each of these spheres is far from being determined, but it is at least certain that the vitellus is especially composed of organizable and nutritive materials. In certain animals its alimentary provision is considerable; a small part suffices for the constitution of the new creature, which nourishes itself and grows at the expense of the rest." The fish, for example, comes out of the egg completely formed, and gradually assimilates the matter which his stomach has enclosed. Among the viviparous animals the vitellus is very small, and the embryo is nourished by materials obtained elsewhere. The oviparous creatures *lay* their eggs, the viviparous retain them for internal development; but birds, worms, reptiles, and men, all are *hatched.*

The viviparous, and many of the oviparous tribes, resemble their parents as soon as they have passed the fœtal stage.

* This term is borrowed from the botanists. In Professor Henslow's valuable 'Dictionary of Botanical Terms' we read "caducous (*caducus,* ready to fall) when a part falls off very early compared with other parts with which it is associated. Thus the sepals of many poppies fall as soon as the flower begins to expand." Caducous germs fall for the purpose of development.

The marsupial animals, such as the kangaroo, forming no real exception, as the seclusion of their young in the pouch is only a second act of gestation. In other species—all of them oviparous—the offspring, at the moment of leaving the egg, differs completely from both its father and its mother. It may possess organs which they have not, and be destitute of organs with which they are furnished, so that changes and metamorphoses are required to bring it back to the original type. M. Quatrefages proposes to restrict the term *transformation* to the designation of those changes which the germ experiences in becoming an embryo, or which it undergoes while still enclosed in the egg. *Metamorphosis*, in like manner, designates changes altering the character of the creature, and, occurring after it has left the egg, or been hatched. *Geneagenesis* refers to the changes which "affect the generations themselves."

In discussing the transformations of the egg, M. Quatrefages refers particularly to his own observations of the Serpula and Teredo. After the laying of their ova, the eggs, whether fecundated or not, exhibit an internal commotion; "a mysterious force agitates the yolk; granulations accumulate now at one point and now at another," so that the shadowy mass changes its aspect every moment. M. Quatrefages considers that similar changes take place in the eggs of higher animals although they may be slower, and more difficult to trace. In the Serpula and Teredo eggs the agitation causes the "Purkinje vesicle" and the "spot of Wagner" to disappear. If the eggs have not been fecundated, the movements become accelerated and irregular, and, finally, decomposition ensues. All through the animal kingdom the male element appears to excite and regulate the germinating force. In the eggs of the creatures named, a little nipple appears on the surface of the altered yolk, from which one or two transparent globules are expelled, the use of which is unknown.

This occurs whether the eggs have been fertilized or not. If fertilized, the expulsion of the globules is succeeded, "whether it be in the mammalia or the serpulæ," by a short period of repose. When activity recommences constrictions become visible, and the yolk assumes a mulberry aspect. The details of the process vary in different animals, "but in all, the consequence of the phenomenon is the formation of a primitive organized layer which envelopes the yolk, and is called the *blastoderm*. As soon as organization begins, it assumes distinctive characters; "the germ becomes the embryo, and from its origin reveals the fundamental charac-

teristics of the group of which the new creature will form a part."

We must refer the reader to M. Quatrefages' agreeable volume for further details on this branch of the subject, and pass to the consideration of a few points in the development of the egg of the mammalia. Here our author tells us the heart soon makes its appearance, accompanied by arteries and veins, and soon after it the nervous system, the digestive tube appearing more late. This order of succession is directed by the method of nutrition, and it is inverted among the invertebrata, where the digestive apparatus precedes the circulatory. In watching the process of transformation, "every day, every hour, the scene changes, and this instability effects essential as well as necessary parts, &c. . . . Here cavities partition themselves into distinct chambers, or extend themselves into canals; and these, in their turn, are filled up and converted into ligaments; films are rolled up into tubes; isolated parts solder themselves together into continuous organs, or uniform masses divide themselves and form several organs. At the same time, relations and proportions change each instant. Parts which had been almost confounded, separate and become strangers; others, which had been separated, approach and contract intimate union. Organs with temporary functions, grow, increase rapidly, acquire an enormous size, and then become atrophied, and disappear. Others stop at a given moment, while all grows around them. They retain their place, and will be found in the adult, where they have no other apparent part than to bear witness to a state of things which no longer exists."

Having got out of the egg and been born, the young mammal experiences *transformations*,* the proportions of the several parts altering at each stage, that of puberty being highly interesting and important. MM. Andral and Gavarret state that at an early age boys and girls respire with equal vigour. Before puberty M. Quatrefages calls them neither males nor females, but neuters. "But as soon," he says, "as the sexes are characterised, the respiration of the young man exhibits a redoubled and rapidly augmenting activity, while in the young girl and young woman this function remains stationary. About the age of thirty the former burns about 170 or 186 grains of carbon in an hour. Subsequently, when the progress of age, and its accom-

* M. Quatrefages entitles the chapter from which these remarks are taken "Transformations des Mammifères hors de l'œuf." Thus he does not follow the nomenclature which he recommends, and according to which these changes would be metamorphoses.

panying transformation, cause the sexes to approach by effacing their more salient characteristics, the respiratory activity of the woman comes nearer to that of the man, but without reaching so high a limit."

From transformation we pass naturally to metamorphosis, and we find that the larva of an insect or crustacean may be regarded as an embryo with an independent life, which obtains its own food instead of being nourished by its mother, and which undergoes before our eyes transformations analogous to those which the young of viviparous creatures experience inside the maternal organism. A proximate cause of metamorphosis may be found in the small amount of organizable material supplied by the yolk of the eggs of creatures which exhibit its peculiar phenomena. In common language, the more imperfect the condition in which the egg turns out its inhabitant, the more extensive the changes which the creature must afterwards undergo. M. Quatrefages observes that, compared with the eggs of certain molluscs, those of insects are enormous. Thus, the egg of the *Cossus ligniperda*, is about "thirty thousand times bigger than the egg of a teredo." We cannot therefore be surprised that from the former there emerges a caterpillar or animal of a complicated construction, while the ovum of the teredo yields only a simple creature, "a homogeneous pulp, in which a digestive tube is vaguely discerned. The first has to fabricate certain organs, but its chief work is to develope and modify those which it possesses, while the last has everything to acquire." In contemplating the changes which we can observe in the lower vertebrates or molluscs we are insensibly led to the philosophy of the case. If we observe the gills and tail of the tadpole disappear, we must, as M. Quatrefages says, exclaim, "Here are organs that become atrophied or dwindle." If we compare the abdomen of a young crab with that of the adult animal, we conceive the idea of "arrested development," and if we observe the Lernea having its limbs, which first acted as oars, changed into a kind of anchor to fasten it to its prey, we cannot but admire the way in which nature appropriates an existing organ to a novel use, and we find the idea of "transformation." In these and similar transitions there is nothing violent, but all goes on in measured order and progression. In our author's words, "the gills of the tadpole do not fall off to make room for lungs; the tail is not detached, because the legs are ready. No; as the one pushes on its growth, with bones, muscles, nerves, and vessels, the other diminishes in all its parts. Molecule by molecule the one is absorbed; molecule by molecule the

other is built up." The moults of crabs and other crustacea do not prove exceptions to this rule, for although the actual change of the hard integument appears sudden, the internal processes which lead to it have been gradually carried on. Among insects the larva prepares the materials which the chrysalis will require; it has, so to speak, stored up in a magazine the materials necessary for its transformation.

We now come to the class of facts which M. Quatrefages groups together under one term, "Geneagenesis." As our readers will probably know, those vexatious inhabitants of the greenhouse or garden, the plant-lice, or *Aphides*, produce a series of offspring without the conjunction of two sexes, and in this mode of proceeding, Bonnet discovered unexpected facts. "He found that all through the fine weather the aphides reproduce their race, if isolated, but when the temperature falls, these animals, returning to ordinary conditions, propagate by eggs which demand the conjoint action of a father and a mother. These eggs pass the winter glued to the branches of the trees on which the colony dwelt that was destroyed by the cold. When they are hatched in spring they yield *viviparous* individuals only; in the autumn males and females appear, and from this moment *oviparous* generation recommences its work." It would have been impossible to place these curious incidents in their true position if Trembley and others had not observed that polyps and similar animals of simple structure can propagate like vegetables by buds. It was also necessary that Chamisso should make his discovery that the Salpæ produce their offspring in the strange fashion which he characterised as the "alternation of generations;" and here we cannot do better than borrow M. Quatrefages' description of a salpa, for the benefit of those to whom this interesting inhabitant of our seas is unknown. He says: "Salpæ are marine molluscs of a very queer shape, which it is difficult to describe. We may, however, figure one as an irregular crystal cylinder, perfectly transparent, in the interior of which is suspended a proportionably small mass of opaque lively coloured matter, called the *nucleus*. This is formed by the junction of the principal *viscera*. The cylinder represents the mantle and the shell of ordinary molluscs, and it is pierced towards each extremity. The water necessary for its respiration enters at one of these apertures and is expelled from the other, thanks to the contractions of the mantle; and making its exit with rapidity, it pushes the animal in an opposite direction, so that the creature swims solely by means of its respiratory movements." For a long

while the attention of naturalists was drawn to these objects, "whose phosphorescence was remarkable even among the fiery waves of the intertropical ocean," and they sometimes discovered them in an isolated condition, and sometimes in chains. It was Chamisso who explained this riddle. He saw that the Salpæ were androgynous (bisexual) and viviparous; that they came into the world in the shape that they preserved all their lives; and that, strange to say, a solitary mother only brought forth infants united in colonies, and these in their turn engendered only solitary individuals. It followed from this that a salpa never resembled its mother or its son, but always its grandfather or its grandson." Upon this curious state of things, M. Quatrefages remarks that "metamorphosis here influences generations and not individuals, and matters proceed as if the caterpillar, instead of becoming transformed, gave birth to complete butterflies, which in their turn reproduced the caterpillars."

(*To be continued.*)

UTILIZATION OF SEWAGE.

To this subject we directed the attention of our readers in a previous number, under the heading of *Carbolic acid as a disinfectant, deodorizer, and therapeutic.*

It is gratifying to know that no less a personage than the Earl of Derby has considered the matter not beneath his notice. At the late meeting of the North Lancashire Agricultural Society, firstly adverting to the advantages derived from machinery in connection with science, he says:—"We are gradually finding out, and it is an important discovery for this country, how entirely and closely mechanical and chemical science are connected with the material interests of agriculture. Day by day we are becoming more and more indebted to science for the progress which we are making, by the largely increased purchase of those implements, without which they would not be shown, the farmers of this country thus showing their practical appreciation of the vast advantages which they derive from them. Why, gentlemen, it is only within a very few years that we have even heard of such a thing as a steam-threshing machine, yet steam is now, not rapidly perhaps, but certainly, making progress as one of the most important elements to be applied to the cultivation of the land. There is no description of

operation connected with farming which is not now acted upon through the advantage of improved machinery, to the great improvement of the land and the crops, and, I am happy to say, without the slightest injurious effect upon the advantages, the wages, or the comforts of the labouring population of the country. We have reaping machines, we have mowing machines, we have every description of machines for acting on every sort of agricultural industry; and this year I see advertised, whether it is likely to be generally applied for or not, at the Royal Exhibition, no less important a thing than a milking machine, one which is to do at one time the duty of two pairs of hands; and the inventor assures us—how he knows it, I do not know—'it is attended with the greatest possible pleasure and comfort to the cow.'"

After this his lordship dwells upon the economization of the sewage of towns:—"To come to a more serious subject, I wish to call the attention of this great meeting, among which I hope there are many practical farmers and gentlemen connected with the land, to a matter which has not yet attracted, but I hope is beginning to attract, the attention it deserves—namely, the economization of the sewage of large towns for the purpose of agriculture. It is, perhaps, not a very savoury subject for after dinner, but as it is our agricultural meeting, I trust I shall be forgiven for saying something about it. I think it is more than twenty years ago that I was addressing the gentlemen of Manchester at a meeting of the Manchester and Liverpool Agricultural Association, and I made then, I will not say a very scientific or very elaborate, but a somewhat lengthened statement, in which I dwelt upon the balance between production and consumption—between reproduction and compensation for waste, and so forth, and went rather studiously into the question; and when I sat down Mr. Mark Phillips—I see my friend Mr. Ainsworth recollects the circumstance—Mr. Phillips rose immediately after and said, 'What the noble lord has said is all very fine, and moreover it is all very true, but all he has said amounts to this, that muck is money!' Now, gentlemen, if that be true, although no doubt there are many men who make ducks and drakes of their money, there is no reason why we should make ducks and drakes of our 'muck.' There is no reason why we should not only waste what was intended for the benefit of our land, but that we should more than waste—that we should abuse for the deterioration and injury of our lands and rivers that which was intended materially to promote the increase of the earth's productiveness. That is a subject which is at-

tended with very great difficulties, and has begun to attract a great amount of attention; and I only wish to remind my friends—and I am happy to find one here who bears witness to it—that that subject was not overlooked by me more than twenty years ago. But as I have referred to it, perhaps you will not think it unduly trespassing upon your time if I venture to call your attention very shortly to a practical illustration of the benefit of it, which I have seen exhibited within my own knowledge, and under my own observation. Gentlemen, it may, perhaps, attach additional interest to the observations which I am about to make, when I tell you that whatever novelty there is in the discovery and in the application of the means, belongs not (to my knowledge) to any man now living, but belongs exclusively to the practical knowledge and experimental observation of his late lamented Royal Highness, the Prince Consort. He had applied his eminently practical mind, among others, to this subject, and he had made various experiments upon it, the result of one of which I have had the opportunity of seeing myself, and of noticing the important effects produced upon the adjoining herbage at Osborne, in the Isle of Wight. That to which I am about shortly to call your attention, and I hope you will pardon me if I do call your attention to matters of this description, is an experiment which has been recently carried out, following the example of his late Royal Highness the Prince Consort, on a small scale certainly, at Wellington College. I may, in the first place, tell you, that the population of Wellington College, if I may so speak of it, is about 300 souls altogether, and there is attached to it a very large laundry for doing the washing of the whole establishment; and I mention this, not as an unimportant fact, because it is important to have for these purposes a very large supply of water, and because those who know anything at all about it know that, for the production of vegetables, and for the cultivation of flowers, also, there is nothing more stimulant than the application of soapsuds and refuse from the washhouses. Now, the novelty of the Wellington College experiment is this: as we had the usual cesspools—that I consider a disadvantage under which we laboured in the first instance—all we had to depend upon was the overflow of the liquid manure through pipes. This, following the plan of the Prince Consort, we conducted a short distance from the college, into a tank, for the purpose of filtering. But it had been found, in all former experiments of filtering, that if you introduced the liquid at the top of the filter-bed, whatever there was of solid contents in it formed, in a short period, a cake at the top, and prevented the penetration of the water; and the novelty introduced by the Prince Consort was this, that the

water introduced came in, not from the top, but from under the bottom of the filtering-bed, and so, by their own force, rising to their own level, the watery parts forced their way through the filtering-bed, leaving the solid materials at the bottom. The filtering-bed consisted of three separate wooden trays, each covered with three or four inches deep of burnt bog-soil. They were separate from each other; the water gradually forced its way from the lowest to the upper one; it then fell over the vacant space, and dropped again to the bottom of the second filtering-bed, through which it rose again in the same way, obtaining a similar amount of filtration. Now, I have very shortly made clear what is the process, and what is the principle. Each of these separate trays was capable, as they absorbed the manure, of being withdrawn and renewed, and fresh trays substituted for them, to collect a fresh amount of sewage. Now, as to the expense of this operation: I wish briefly to mention to you what has been the expense, so far as my observation has gone, and what has been the result. In the first place, the original expense of land, tank, and pipes leading from the tank, was £113. In the course of the nine months during which the college is open, we have collected from the bog-soil which was placed upon the premises an amount equal to ninety-six tons of the best manure, equal, at a value of 8*s.* a ton, to £38 a year, or one third of the whole expense, in the first year of the tank which we established. But the solid manure so obtained was not our object; that was an object obtained by the way; but our object was to obtain the liquid manure for the purpose of irrigation. To give you an idea of the sort at Wellington College, let me tell you, that when we first purchased the land we gave £10 an acre for the fee simple of it, and we were told that we had given twice as much as it was worth. In point of fact, it is the very worst description of Bagshot Heath—a thin layer of worthless sand above a mass of gravel, which is utterly impenetrable to water; a disagreeable soil, varied by an occasional swamp, with some bog-soil in it. The lower land certainly is of a deep brown clay, which, when reclaimed, is the more valuable portion. Now, this land had never produced a blade of grass before we took it in hand; and from this small tank we made the experiment last year. I admit it was on a small scale; and we have now thirty or forty poles under grass, and from this we obtained in one year eight cuttings of the finest grass, beginning on the 7th of April to cut our first crop, cutting it every three weeks for the next half-year, and yet half of the crop which was left was at least one foot in height. In addition to this, we supplied by our own means from this soil, the college with potatoes and

some of the finest vegetables I ever saw in my life; and I ought to say, that the annual expenditure attending the burning of the bog-soil and the cleaning out of the tanks amounts to about £15, in return for which we are able to irrigate nine acres of land with the success we have reached in the course of the present year, and with the result I have mentioned to you in the shape of produce raised upon soil which never yielded anything before, except stunted heath, in the memory of man. And so rich, after this double irrigation, is the sewage we obtain, that the tenant of an adjoining farm takes from us the waste, which leaves our land and flows upon his, and applies it for the purposes of irrigation; and the owner of that farm, in return, allows us the free use of a valuable spring of water. Now, although this is an experiment upon a small scale, I hope it has not, under the circumstances, been out of place in me to trouble you with it. Whatever may be done on a small scale, I believe, where circumstances are favorable, may be done equally well upon a large scale; and I believe, if men sedulously set themselves to work to ascertain the means of solving this great and most important national problem, they will not only succeed to a very great extent, but will attain, even under adverse circumstances, very beneficial results. So far as we have ascertained, for the purposes of making use of this irrigation, it is necessary, or, at all events, it is a great saving of expense, to have such a level as that the water may descend by its own gravity, and it is also necessary that you should have a great supply of water. It is further necessary that the land, if it is intended for arable purposes, should be well ploughed and pulverised; and I believe I may also say, that no doubt it has a much greater effect upon light lands than it has upon heavy lands, and, moreover, a much greater effect upon grass lands or upon vegetables than it has upon arables, and that description of produce. But in order to show that I am not talking for the mere purpose of talking, and without any practical effect, I wish to conclude the observations I have made upon this subject by saying, that, so thoroughly am I convinced of the importance of pushing this science much further than it has been pushed hitherto, that I am ready to give a premium of £100 to the first person, or to the first company, which shall have successfully—by which I mean also profitably to themselves, because otherwise it could not serve for an example—utilised, to use the common phrase, the entire liquid sewage of a district comprising not less than 4000 inhabitants; I mean any district within the limits of either the North Lancashire or the Liverpool and Manchester Agricultural Societies. If I should live so long, and be so happy as

to see each of those societies in the same district producing a successful operation, so great will be my satisfaction in that result, that I shall not hesitate to give £100 to the one, and another £100 to the other."

SEWAGE OF TOWNS.

The select committee on the sewage of towns has just concluded its inquiries, and the report may be soon expected. The following is a summarised analysis of the evidence. As regards the value of town sewage, in reference to its ingredients, as compared with other manures, liquid and solid, the evidence proves that it contains the elements of every crop that is grown; it does not lose anything by evaporation; it comes into immediate action on the crop, and possesses an amount of heat which stimulates vegetation, and even its water is of great benefit for agricultural purposes. The Belgians consider the excretion of each person worth more than £1 per ton. The sewage permanently improves the land, and has been applied, most economically by hose and jet, with great advantage to common grass, Italian rye grass roots, and grain crops. The grass so stimulated is grateful to cattle, improves their constitution, and increases the quantity and richness of the milk of cows, as the earth not only absorbs, but also deodorises it, if it be not applied in too large quantities. Indeed, to be profitably used, it must be applied in slight dressings and so employed it will supercede the guano and artificial manures. It may be applied at any time of the year, except during hard frosts, to every description of soil which is naturally or artificially drained; and the most profitable returns, as in the case of all other manures, will be obtained when it is applied to the best soil. There are in it matters of themselves injurious to vegetation, but they bear so small a proportion to the entire bulk as to be perfectly harmless. If applied as recommended—*i. e.*, in slight dressings—no nuisance would be created by its use, the earth, as has been said, deodorising it; but it cannot with profit be manufactured into a solid manure.

The Chancellor of the Exchequer lately asserted that "The whole subject of the application of manure to the soil, the whole theory of what is termed utilizing those vast materials which are annually wasted, and of making them available for the fertilising of the soil, has yet to be carried out to perfection. Many useful discoveries I admit have been made, but many more remain to be made. It may possibly seem

strange if I were to use such an expression as that both agriculture and commerce were still in a state of infancy. We have yet many more sources of wealth and many more means of producing wealth to open out, than at present exist; and I may also add that many of those sources are, in my opinion, at the present moment entirely unknown. Take, for instance, the case of the sewage of our great towns; and, above all, take that of London; it would hardly be believed, so extraordinary a thing is it, that up to this present moment it is uncertain whether the enormous amount of wealth which is undoubtedly contained in that sewage can or cannot be realised, and the most important questions of health connected with it are at this moment unsolved. We are gradually, it is true, getting towards a solution. For a long time we were content, in a manner so slovenly as to be unworthy of any amount of civilisation, to allow that great mass of sewage not only to escape from our land, but to poison the noblest of our rivers, upon which a great city was built; and it was only four years ago, when it pleased Providence to remind us of our duties by causing old Father Thames to give us notice of his displeasure, by sending up one of the most abominable and protracting stenches that ever entered the nostrils of mankind, that we set about a work of legislation which involved the expenditure of millions of money, but the consequence of which will be that, in all future times, no part of that immense mass of sewage will find its way into the river; but the Thames will become again what it was originally, a pure and beautiful river."

NOXIOUS VAPOURS.

The deleterious effects produced on the organization of both animals and vegetables by gaseous emanations, are well known to those living in the neighbourhood of works where either the manufacture of certain chemical compounds is carried on, or the smelting of certain metals takes place, as of tin and copper. The legislature, with the view to prevent this destruction of life and health, during the last session appointed a committee to inquire into the injury resulting from these noxious vapours, and the report has just been published. The following is the most important portion of it.

The committee think that it would be most desirable that the laws respecting nuisances generally should be consolidated and made uniform throughout the country; but, whether this be practicable or not, there are certain points on which amendment appears to them to be urgently required. They

recommend that the provision of the Smoke Prevention Act respecting offensive trades should be made of universal application; that gases evolved in manufacturing processes from furnaces or chimneys should be placed on the same footing as smoke from furnaces; that full effect should be given to the 23rd and 24th Vict., c. 77, s. 13; that medical inspectors when appointed, should have the right of free access to all works productive of noxious vapours at all hours when such works are in operation; that the power on the part of the defendant of demurring to the jurisdiction of the magistrate should be abolished, and, if any appeal be allowed to the superior courts, they would be inclined to restrict it to cases in which the magistrate should certify that they involved questions of law fitting to be there heard and decided. While, however, the committee think that the alterations they have suggested will be found adequate for the more ordinary nuisances, yet, looking to the very serious injury caused by alkali and other chemical works of a like description, to the great extent of those trades, and to the proved and admitted preventibility of any nuisance by proper precautions, they concur with manufacturers engaged in those trades, that they ought to be dealt with by special legislation. They do not hesitate to express their opinion that the legislature should not attempt to prescribe the specific process by which the nuisance should be prevented, but that a substantial penalty should attach to the escape of gas or vapour during the process of manufacture; that any person should be at liberty to sue for such penalty; and that it should be recoverable at quarter sessions, without appeal to the superior courts, except in cases in which the magistrate should certify that they involved questions of law fitting to be there heard and decided. But the committee feel bound to record their opinion, that, for the effectual suppression of this nuisance, it will be necessary that inspectors, properly qualified, should be appointed, who should at all times have free access to the works, with or without notice, so far as may be necessary for ascertaining that nuisance is effectually prevented, and who should be officially charged with the duty of enforcing the law; and, without desiring to imply any suspicion of the local authorities, they concur in the opinion, expressed by more than one witness, that such inspectors, by whomsoever appointed and paid, should be wholly independent of all local control, and removed as far as possible from all local influence. The committee have reason to believe that, in framing a measure on these principles, her Majesty's government will have the cheerful co-operation of all the most respectable manufacturers engaged in the trades affected by it.

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

MEETING OF THE IMPERIAL SOCIETY OF VETERINARY MEDICINE OF PARIS.

At a meeting of the above society, held on the 14th of November, 1861, M. Sanson read a report from a committee which had been appointed to answer the question addressed by the Minister of Agriculture to the society, relating to pleuro-pneumonia, and the advantage of inoculation as proposed by Dr. Willems as a preventive.

The committee resolved to send the following answer to the minister:—"The society shares in the opinion on the question which you have done it the honour to consult it, which was promulgated in the letter to his Excellency the Prefêt of the Department of the North; in consequence of which it does not deem it necessary to carry out the views of the agricultural committee of the arrondissement of Lille, recommending the intervention of the government to induce the cultivators to inoculate their cattle for pleuro-pneumonia, whatsoever might be the advantages of the generalization of this practice in regard to agricultural produce, of which neat cattle is the principal element." After several meetings the society was called upon to decide the question at its sitting on the 23rd of January, 1862, when M. U. Leblanc said that there were two ideas expressed which ought to be separated. In the first part the commission expresses an advice to be submitted to the minister, which no doubt will be shared in by the society; but in the second, inoculation is approved of as a prophylactic against pleuro-pneumonia. M. Leblanc does not think that the society ought to adopt conclusions which would implicate it in this respect, for the question of inoculation is finally settled in the sense adopted by the majority of the commission; he therefore proposes to omit the second part.

The reporter says, that according to the bearing of the conclusions, the question as to the value of inoculation is reserved.

M. U. Leblanc is not of the same opinion; he thinks that the society would promulgate by it an opinion laudatory of the value of inoculation, and which he believes the society

in the present state of the question is not in a position to do.

The President said that these two ideas should be stated in the conclusions proposed, one which deals with the intervention of the administration on the question of inoculation, the other which advanced an opinion more or less explicit on the prophylactic value of this measure. And he agrees with M. Leblanc as to the necessity of separating the two parts of the conclusions, and to submit them separately to the consideration of the Society.

The first was then submitted to the Society and adopted; the second was rejected.

Journal des Vétérinaires du Midi, March, 1862.

INTERMITTENT FEVER WITH PARAPLEGIA IN A COW.

By M. Loucou, Vétérinaire à Salvaguac.

The subject of this case was a cow, ten years old, very much out of condition. The symptoms were uneasiness, dejection, weakness, loss of appetite, rumination suspended, the eyes languid. The animal seemed as if suffocation were imminent, and moaned as if suffering great pain. The pulse was small, hard, and irregular; the mucous membrane pale; the ears and legs cold. General rigors were also present, with grinding of the teeth, and much depression. She seemed instinctively to shrink, so as to present less surface to the surrounding air, thereby avoiding its action; the respiration was laborious, embarrassed, and precipitated, as if by exerting the whole force of the respiratory organs the animal was endeavouring to obtain the greatest amount of caloric, so as to enable it to contend against the intense cold by which it was affected. By pricking it with a pin to make it get up, it did not move, but on repeating this several times, the anterior limbs were strongly agitated, while the posterior ones remained immovable. It was thus clear that the hinder parts were paralysed; but to ascertain whether there was only a diminution or total loss of sensation, the author pricked the parts repeatedly with a pin, without causing the slightest muscular contraction, he therefore was convinced that there was total loss of motion as well as sensation. The muscles were in such a state of tension that it would have been easier to break the articulations than to flex them.

The *diagnosis* was paraplegia, and from the gravity of the malady the *prognosis* was most unfavorable, as there could be hardly a doubt but that the termination would be fatal.

The *treatment* consisted in frictions with camphorated spirits of wine on the lumbar region and the hind extremities, and dry frictions over the rest of the body, to which was added warm clothing. To exalt the nervous sensibility, fifteen grammes of nux vomica were administered in an infusion of camomile. As ruminants are not in general much affected by this medicine, and moreover the patient being old, and it being necessary to produce a strong effect, the author says, as a true disciple of Rasori, I thought it advisable to give this large dose at once. A restricted diet was also ordered. On the next day, to the surprise of all, the patient was much better. There was, however, stupefaction present, but the patient was standing up, and seemed inclined to feed, although it was very weak. The frictions were discontinued, the dose of nux vomica lessened, and a preparation of iron added.

The proprietor informed the author that some hours after the frictions had been applied the animal became very restless and agitated, also very thirsty, manifesting a strong desire for cold water; that the eyes were very bright, and the body hot, which was followed by a copious perspiration of a fetid odour. So great, indeed, was the perspiration, that the blankets with which the animal was covered were as if they had been dipped in water. All this was somewhat embarrassing, and difficult of explanation.

The case having come in on the 2nd of January, by the 6th the rigors had disappeared, the temperature of the body was almost natural, the skin moist, the hind extremities had recovered their sensation and motion, and the appetite was good. On making the patient walk a few steps, it was performed with great difficulty.

On the 7th, 8th, and 9th nothing particular occurred. The treatment was the same, and the improvement continued.

On the 11th the change was well defined, the animal had a lively appearance, ate with avidity and ruminated, and the mucous membranes had a healthy tinge. The treatment was now discontinued altogether, and the rations were increased.

On the 12th the proprietor came to announce that the animal was taken in the same way as before. On visiting it, she was found to be dull, refused food, the coat staring, but the tremors not so frequent, the nose and legs cold, the pulse small, quick, irregular, and easily compressed, the respiration

accelerated, the conjunctiva pale, violent chattering of the teeth, and the paraplegia was again complete.

The previous treatment having been so successful, it was again resorted to, also the same hygienic care was recommended. As it was impossible for the author to lose much time in watching the symptoms, the proprietor was requested to notice their development.

On the 13th the animal was more lively, the eyes were brighter, there was complete anorexia, the patient was lying down, but got up without difficulty, and the paraplegia had almost disappeared. The same treatment was continued.

The information obtained from the proprietor was that some hours after we had left, the coldness of the body subsided, and the heat had gradually increased, but that the perspiration by which it was followed had not been profuse.

In comparing the symptoms in these two accessions, there was a striking analogy which excited the author's attention, and taking into consideration the time of the intermittence, and carefully examining all the symptoms, he concluded that it was a case of intermittent fever. In consequence of this the former treatment was discontinued, and replaced by the administration of forty grammes of cinchonine, given in a decoction of willow bark, but on account of the high price of the cinchonine, it became necessary to reduce the quantity and to discontinue it altogether after the fourth day, but the decoctions of the willow bark were continued. If this last medicament has not the febrifuge virtue of cinchonine, it is at least the best substitute for it, and has the great advantage of being very cheap.

The patient under this treatment visibly improved up to the 21st, when she had entirely recovered her appetite, and again ruminated; the paraplegia had also disappeared, and she had every appearance of restored health.

On the 22nd the author was again sent for, when he found the animal in the following state: loss of appetite, rumination suspended, great depression, horripilation, partial perspirations, but not copious, great heat of body, the conjunctiva red, the pulse full, respiration short, anxious and hurried, the beating of the heart embarrassed and confused, great uneasiness, much thirst, and the animal seemed under the influence of great anxiety, the eyes were sunken, and she was extended upon the litter as if she would never get up again. The symptoms of paraplegia had also again appeared, but were less manifest. To ascertain whether there was any diminution in the sensibility, the patient was slightly pricked with a pin, on which great pain was evinced, with convulsive

movements. The sense of touch was so very acute that the slightest contact with anything greatly exasperated the patient. The power of locomotion, without being abolished, was greatly diminished.

The proprietor said, that up to that time nothing unusual had occurred. As the malady had proved somewhat obstinate in the treatment, it was deemed expedient to make some slight modification. Tincture of strychnine was applied to the lumbar region, the cinchonine was replaced by the sulphate of quinine, eight grammes of which were administered in a decoction of willow bark, immediately after the attack had passed off. The patient was ordered to be kept warm, if cold prevailed; if, on the contrary, she were hot, aromatic drinks were to be given, and if the heat increased, to take off the clothing, so as not to provoke perspiration, which would only tend to debilitate the system, and thereby extinguish the remnant of vitality which was becoming very precarious. The drinks were to be acidulated if the perspiration was too abundant.

On the 23rd the animal was inclined to feed, and began to ruminate; the paraplegia disappeared, the posterior extremities were still a little stiff, all the other morbid symptoms were changed, but there was extreme debility left, indeed so much that she could hardly stand.

From the 24th to the 27th the state of the patient was much improved; the tonic treatment was continued, and also the prophylactic means.

On the 2nd of February the cure was nearly complete. On the 5th all treatment was discontinued, and the animal seemed now in perfect health.

In comparing the symptoms of these three accessions, a great similarity is remarked, and the author is, therefore, of opinion, that he has had to deal with a case of intermittent fever.

Observations.—These affections have been but little studied in domestic animals. Volpi denies their existence; Lafosse doubts them; Hurtzel d'Arboval thinks that domestic animals might be affected with them, but that the cause depends on some lesion; Girard, junior, admits of their existence. According to him they are but a group of symptoms characteristic of local inflammation, and he similates it to bilious and carbonous fever, and confounds it with gastro-interitis. Lautour, Clichy, Rodet, and M. Reboul have published some facts to prove the existence of these morbid derangements, but in the horse only. Solleysel, Garsault, and Bourgelat state, in their writings, that these maladies may prevail in all domestic

animals. Huzard, junior, in his writings, admits all the maladies which prevail in man. All these authors, though admitting the existence of these fevers, have produced no facts, as far as we know, in support of what they advance, to prove that these maladies develope themselves in other animals than the horse. We do not believe that a similar malady has ever been described in the bovine species.

CANCEROUS DEGENERATION OF THE HEART IN A COW.

By M. Guimberteau, Vétérinaire St. Antoine (Dordogne).

We seldom meet with cancerous alterations in the heart, and when they occur there is great difficulty in their diagnosis, on account of the symptoms not having been correctly described. This circumstance will, perhaps, give some interest to the following case. The cow, the subject of this affection, was of the Garonnaise breed, about seven years old; had been bought a few days previous to the author's visit, which was on account of a lameness in the right fore leg. After a careful examination nothing could be detected, except that there was a little increased sensibility round the coronet. This was supposed to be the cause of the lameness, and being attributed to the journey, a cooling lotion and quietude were recommended, and the cow soon got well, and was put to work; she was, however, unable to continue at it, and a fresh examination was made, without detecting the real cause of the lameness. The animal was now ordered absolute rest for a month, but did not get much better. The owner, who seemed careless about the consequences, again put the animal to severe work; and a few days after a cough, which rapidly increased, manifested itself. Fearing now that it might be phthisis, the author was again consulted by the proprietor, with a view to the redhibition of the cow. On again examining the animal he found the following symptoms to be present: the head held low; she was tucked up at the flanks, the coat staring, great heat of the skin, muzzle dry, respiration short and accelerated, a frequent hard and dry cough, the mucous membranes red and injected, the pulse strong and accelerated, percussion on the parietes of the chest caused pain, and auscultation denoted a diminution of the respiratory murmur on the left side. To all these symptoms must be added loss of appetite.

The diagnosis was the commencement of pneumonia, and

the treatment prescribed was accordingly. One symptom, however, which struck the author, was the dilatation of the jugular vein after venesection. This was attributed by him to the congestion of the lungs; but after repeated bleedings, the vein did not disgorge itself, although all the other symptoms subsided, and there was a chance of a speedy cure; but the animal became very weak, the appetite decreased, the mucous membranes became very pale and infiltrated with serum, the pulse small and accelerated, and there was loss of power in the anterior parts of the body.

The *diagnosis* was now organic disease. The lungs being perfectly free, the author fixed his attention on the heart, which he ausculted with great care several times. The beatings were not very perceptible, which seemed to indicate effusion into the pericardium; the pulsation was irregular, that which corresponded to the left ventricle being strong, while the other was hardly perceptible. From these facts, and taking into consideration the turgid state of the jugular veins, the slow progress of the malady, and the irregularity in the beating of the heart, the author thought he had to deal with an abscess in the heart, or a cancerous degeneration of that organ, but was inclined towards the latter opinion, which he communicated to the proprietor.

The animal sank under the disease two months after, which enabled the author to verify his diagnosis. The pericardium contained nearly six litres of serum, in the midst of which floated flakes of organized lymph; the whole of the cellular tissue was infiltrated, the jugular veins were gorged with blood, and on making an incision in the right wall of the heart, which was of an enormous size, so as to nearly obliterate the ventricle, there were found many cavities, with their partitions, containing pus, resembling, in colour and consistence, a solution of gum, or gelatine, in which were observed flakes of a yellow colour, which appeared to be formed by a coagulum of fibro-albuminous matter.

It was, therefore, a true cancerous degeneration of the right side of the heart.

A VARIETY OF GASTRITIS IN AN OX.

By M. Gilis, Vétérinaire.

This malady, of which the author gives a short description, has, he says, often been observed by him in the larger ruminants.

Symptoms.—Loss of appetite, suspended rumination, redness of the mucous membranes, meteorization, which becomes intense in a very short time, resisting the administration of ether and ammonia, and is only relieved by a puncture of the rumen, but it soon returns if the tube is taken out or the opening closed, threatening asphyxia, from eight to twenty-four, or even forty-eight hours after the *début* of the malady, which, of course, would cause death to supervene, if exit were not given to the gas, either by the pressure on the lungs or increasing the inflammation of the mucous membrane of the stomach.

To these symptoms must be added pain, evinced by pressure given to the rumen, and this is more marked during the meteorization; the patient moans, is anxious, and looks towards the abdomen. During the decubitus the moaning increases, and the respiration is more impeded; the animal turns its head more frequently towards the seat of pain, and when the sufferings increase, lays its head on the manger, while the hind legs are extended on the litter; twitching, too, is often observed. Towards the eighth, tenth, and fifteenth day after the attack, there is a tendency of the malady becoming chronic, notwithstanding the best treatment being adopted; in which case the appetite becomes capricious, rumination takes place only at intervals, and the tympanitis persists, and is less intense.

From the above-described symptoms the author feels himself justified in designating it a variety of gastritis (gastrite intense). This malady, according to Vitet, as given in the dictionary of H. d'Arboval, resembles the one just described. When abandoned to the efforts of nature, the prognosis of this malady is very grave in the cow, as the effect of the meteorization may cause abortion when in calf, the consequences of which are more or less dangerous. The author has never observed any symptoms of cerebral complication, owing, he thinks, to the treatment he adopted, from which the beneficial effect was very quick.

The duration of the disease, notwithstanding the most assiduous attention, is from three to twenty-four days. The causes are bad water and forage, principally sandy hay; certain drugs given in large doses, such as nitre. The malady sometimes developes itself after acute laminitis. Other causes, no doubt, exist, with which we are not acquainted.

The treatment consists in calming the irritation of the gastric organs, and puncturing of the rumen to remove the meteorization, which is frequently excessive, even before the practitioner is sent for. The tube must be left in for some

time; from eight, ten, to twenty days. This can be done without fear of accident. One can only be sure of the cure being complete when the appetite and the rumination are restored to their normal condition.

ORDER OF COUNCIL.

By a subsequent Order of Council, published in the *Gazette* of September 19th, the parishes of Stanton St. Bernard, Avebury, and Aldbourne, in the county of Wilts, and Hampstead Norris, in the county of Berks, are included in the list of those in which all traffic in sheep is interdicted for the next three months.

ARMY APPOINTMENTS.

Light Horse Volunteer Corps.

Mr. Gilbert Heyes, M.R.C.V.S., has been appointed Honorary Veterinary Surgeon to the 2nd Lancashire Light Horse Volunteer Corps, August 4th, 1862.

MISCELLANEA.

DESTRUCTION OF SHEEP BY DOGS.

A parliamentary return just issued shows that the large number of 8897 sheep were killed by dogs within the constabulary district in Ireland from the 1st of January, 1861, to the 1st of January, 1862. In the county of Donegal alone the number killed was 2399.

OBITUARY.

Died, July 7th, Mr. John Wallis Nobbs, Cerne Abbas, from gastric fever; the deceased was thirty-five years of age and was veterinary surgeon to the Queen's Own Yeomanry Calvalry; he passed his examination in 1847. Mr. Nobbs was the third generation of veterinary surgeons, both his father and grandfather were in the profession.

Died on September 5th, Robert Thomas Lambert, M.R.C.V.S., London, aged thirty-two. His diploma dates May 1st, 1856.

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Communications and Cases.

OPENING OF THE SESSION AT THE ROYAL VETERINARY COLLEGE.

INAUGURAL ADDRESS BY PROFESSOR SIMONDS.

Gentlemen,—I do not know that I can better impress upon the minds of those of you who occupy these benches for the first time the true importance of the studies you are about to commence, or hold out greater inducements for renewed energy to those who have already passed a Session here, than by pointing out, at the very commencement of this address, one or two considerations arising from the recent appearance of smallpox among the flocks of this country. I do not propose, however, to enter into any detailed history of the outbreak. This is not the occasion, neither has the time come, when such a history might be rightly presented. I am wishful rather to direct your attention to the relation which such formidable manifestations of disease have upon the welfare of the community, and the duty of the veterinary practitioner in reference to them. It is by observing similar wide and destructive irruptions of fatal maladies among our flocks and herds that we best learn the dignity of veterinary science, as also the true place and highest office of the veterinary surgeon in a community.

Smallpox is unhappily still so familiar and so deadly among the population of this kingdom, that the youngest tyro is not unacquainted with the dread nature of the malady which the term indicates. The allied disease among sheep, less familiarly known, is not less—nay, it is even more—fatal in its progress than its human congener. Before 1847 the malady had not been observed among the flocks of this kingdom during the present generation, but it had long been prevalent and was well known in several of the great sheep districts of the continent. In some, in fact, the affection

is naturalised, so to speak; while in others it has shown itself from time to time in wide and disastrous outbreaks. Within historic periods the disease has probably at no time appeared among healthy flocks unless there had been prior communication, immediately or remotely, with animals suffering from the affection. One sheep will infect a whole flock, one flock an entire district, and several flocks spread the area of infection over a vast country. And so it has happened once and again in France, in Germany, and in central Europe. But while this communication of sick animals with healthy may be said to be an essential element in the propagation of smallpox, it is also seen that this cannot be the sole element. Now the disease is observed to break out in one or two scattered instances, and die away; and anon it prevails with a malignity which sets almost all control at defiance. At one time, in fact, the flocks show a much higher degree of susceptibility to the poison than at another; and this consideration has to enter largely into the question of prevention, where, as is the case with our neighbours on the continent, the affection is never absent from certain districts.

I may add that, while in the human smallpox we possess a simple, efficacious, and almost altogether harmless means of prevention in vaccination, we have no similar unobjectionable method in sheep-pox. Vaccination would appear to afford no protection to the sheep; and where the separation of affected animals proves insufficient to stay the spread of the disease, there remains only inoculation to be had recourse to. Nothing is more efficacious than this measure for securing the ultimate welfare of infected flocks or the interests of the agriculturist and the community, where it is rightly adopted and with such precautions as its nature requires. Indeed, while we may regret that the less formidable disease induced by vaccination has not proved a safeguard in the sheep as in man, it is not to be forgotten that the protection yielded by inoculation, from being more complete than that which vaccination could under any circumstances be expected to give, is in this respect more valuable.

I can well understand that so great an authority as Dr. Copland should, on account of the greater protective power of inoculation, express something like regret that the measure is, in this country, prohibited for man. He apparently entertains a doubt of the greater value and even fitness of vaccination, as a protection against smallpox. On the justness of this doubt I express no opinion; but I have thought it well to allude to it at a time when the events in Wiltshire have led to much public discussion of the true worth of inoculation, and when the

fact of inoculation having been prohibited in man has been made an argument for its prohibition in the sheep. It has been forgotten by the objectors that we have no option in the sheep, as in man, between vaccination and inoculation. Wide and extended experiment has shown that vaccination is valueless as a protection against smallpox in the sheep. But wider and more extended experiment has further shown, on the other hand, the great value of inoculation in mitigating the severity, diminishing the losses, and restraining the *epizoötic* tendency of the disease. What Dr. Copland states of inoculated smallpox in man, in his great and unrivalled work, is, in many respects, true also of the inoculated affection in the sheep.

"The chief objections here urged," he writes, "against inoculation were partly specious and partly just. Inoculation, practised by ignorant, unskilled, and unprofessional hands, in improper seasons, ages, and circumstances, or with a total disregard of the states of health of those subjected to it, may occasionally be followed by dangerous or even fatal results. Nevertheless it has been shown that, with all these drawbacks, and without the precautions, the science, and the care which the educated physician can employ, the proportion of deaths among the inoculated does not rise above 5 in 1000. That inoculation would spread the distemper is certainly true when a few only resort to it; but even such diffusion would prevent the recurrence of those pestilential epidemics which follow the accumulations of a great number of unprotected in one locality, and would diffuse the disease in a milder form than when it occurs epidemically; for it has been fully proved that infection from the inoculated distemper generally does not communicate so severe or dangerous an attack as infection from a natural and epidemic cause. Besides, if inoculation were generally adopted at a proper age, there could not possibly be the *pabulum* for an epidemic outbreak, and scarcely the occurrence of a natural case.

"Against this amount of unfavorable contingency must be placed the firm confidence of protection which inoculation furnishes to all persons, in all climates, and to all races within the tropics, and to the dark varieties of the species. In these climates and races vaccination (which the law has made to supersede inoculation) has been demonstrated to be inefficacious; but in all these circumstances, however diversified or opposite, inoculation has been found, and still is found, the most certain protection from the severer distemper and from epidemic outbreaks."*

* 'Dictionary of Practical Medicine,' vol. iii, p. 830.

When smallpox appeared among the flocks in England in the autumn of 1847, it was introduced by certain foreign sheep sold in Smithfield Market. The disease spread rapidly, and committed frightful ravages in several counties in 1847-48-49-50. In some instances upwards of half the flocks were swept off. Since 1850, however, the malady had not been heard of among our flocks, until the month of June last, when it broke out at Allington, near Devizes, in Wiltshire. The affection had made considerable headway in the flock first attacked before its nature was ascertained. Neither the proprietor nor the shepherds were convinced as to the real character of the disease until my aid was sought late in July, by which time many animals had been lost. It is still uncertain in what manner the disease was introduced into Mr. Parry's flock, but this point may be cleared up, at least in some degree, by subsequent investigation. What is important to be noted here is that the disease soon showed itself in other neighbouring flocks, and subsequently extended into an adjacent county—Berkshire. At the present moment there is good hope that—thanks to the measures of prevention adopted—the progress of the disease is stayed in the vicinity where it first showed itself; but it would be premature as yet to express any decided opinion on the probable further course of the outbreak. Its nature and the period of the year alike forbid a hasty conclusion in this matter. I trust that the course of the malady may be stayed, but we cannot conceal from ourselves the probability—a probability taught by bitter experience—that the disease may still spread more widely, and that our flocks may suffer ultimately from a visitation as calamitous as that which befell them in 1847-50.

To enable you to form some estimate of the true character of a visitation of this kind, occurring at the present time, I would point out to you that the value of the sheep in this country amounts to many millions sterling; that the loss by death from natural smallpox ranges from one fifth to one half, or even more, of an infected flock. The loss by death involves, however, but one portion of that which is suffered by the farmer, for we must also estimate the effects exercised upon the breeding and rearing of lambs, the fattening of sheep, and the destruction or damage of fleeces, to say nothing of the cost of care and attendance. But this is not all. Grave as is the probable loss to the individual, not less grave is the effect upon the community. Putting aside the unfavorable influence which a wide outbreak of so fatal an epizoötic may exercise upon several branches of industry, we need simply mention the detriment arising from the

diminution of supply or the heightened price of mutton in the market. No doubt the mention of this latter evil would excite a smile of derision from those *quasi*-philanthropists, the *vegetarians,* who recently held a public self-gratulatory meeting at the Crystal Palace.

> "Some only eat of certain herbs, and lay
> Under dread ban all fish and flesh and wine,
> Extolling green things and the sparkling spring;
> As if brutes only spiritually lived,
> And virtue were a vegetable thing."

What I am disposed to regard as an unmitigated evil the vegetarians would probably look upon as an undoubted good. Alas! they have not examined narrowly into human nature and the history of the physical ills which may overtake it, when they could speak of the privation of flesh-meat among the famine-stricken cotton-weavers as a source of good.

Truly may it be said we cannot lose or undergo a diminution of any staple article of food without suffering from the loss. This may not tell upon us at the moment, but sooner or later it renders its account — weakening our powers of resistance against the insidious onslaught of some deadly epidemic. The rise in price of butcher's meat to the extent of a halfpenny or a penny in the pound, will as surely tell a fatal story in the Registrar-General's returns of mortality as shot and shell in the field of battle. A large proportion of our population at the best live but a shade or two above the point of starvation; a still larger proportion are insufficiently and badly fed. An outbreak of an epizoötic among cattle or sheep may often make the *differential* element in the outbreak, or not, of epidemic disease among these persons in the forthcoming year. Hence it is that outbreaks of disease, such as that which has occurred in Wiltshire, involve questions of national as well as of individual importance—questions touching not only upon personal losses, but also on losses seriously affecting the welfare of the whole population.

It is from this point of view that we obtain the most just idea of the true dignity of veterinary science and the right place of the veterinary practitioner in the community. From this point also we obtain the most correct estimate of his duties, for it is upon the progress of veterinary science and the skilful exercise of the veterinary art that a community has to depend for its chief safety and protection from the evils arising from epizoötic diseases. This consideration heightens our responsibility to the utmost in the practice of our profession. Inaccurate appreciation of, or indifference or

carelessness to this higher responsibility; an error of judgment; a misapprehension of the true character of the disease with which we have to contend, may be a source of immeasurable public suffering—suffering not the less actual because it may escape immediate observation and detection.

But to show this more fully—since if here we might find our greatest condemnation, so here we may discover our highest honour, not only as a profession but as individuals.

Soon after the cholera of 1832 had ceased its ravages, a most fatal epizoötic, which had previously prevailed in many parts of the continent, appeared among the swine in this country, but more particularly in Ireland. This affection continued many years in the latter country, now showing itself in one district, now in another—now prevailing with a less, now with a greater, degree of malignity. The pig is one of the chief sources of wealth and the chiefest source of animal diet among the Irish peasantry. But the recurring outbreaks of the epizoötic referred to almost annihilated the animal.

Again, Ireland is, as I need scarcely tell you, a great cattle-breeding country. Here, as in England in 1842, the deadly pulmonary disease, known as pleuro-pneumonia, which had so long devastated the herds of the continent, also made its appearance, and for several years did incalculable mischief. Moreover, in 1843 the *rot* proved most destructive among sheep in Ireland, and fowls also suffered largely from an epizoötic affection. During these visitations cattle and sheep also suffered more or less extensively from the *vesicular* disease of the mouth and feet. This malady, although not very fatal in its progress, still proved highly detrimental to both flocks and herds.

It was at a time, then, when the great staple articles of animal food of the Irish peasantry had been well-nigh destroyed—when the chief source of disposable wealth of large numbers had been rendered well-nigh worthless—when the bulk of the agricultural and operative classes were suffering from the gradually developed, but not less sure, effects of an impoverished diet, long continued,—that the great failure of the potato crop occurred, one of a series of events in the vegetable world similar to those observed in the animal. The awful famine and pestilence which followed stand almost alone, in their sad consequences in the history of Europe in modern times; and that "disruption of the social condition of the nation" (as Mr. Wilde has well phrased it) which these evils gave rise to, has left traces which even at this date may be clearly distinguished. Nearly *sixteen millions sterling* is the estimated value of the produce which was destroyed; out

of a population of 8,000,000 nearly 3,000,000 received food gratuitously on July 3rd, 1847; and the mortality reached almost 1,000,000 while the famine lasted. Many thousand people, moreover, panic-stricken, fled the country.

Unquestionably the determining cause of the great Irish famine and pestilence of 1845-50 was the failure of the potato crop; but one source of the destructiveness of this visitation—a chief cause, indeed, of the little power of resistance against its evil influence—was that impairment of vitality and inability to contend against disease, which was associated with a deprivation of animal food, to which the bulk of the population had been subjected for several years. The absence of such deprivation, and of that deterioration of stamina which is occasioned by it, I do not hesitate to say has exercised a most important effect in hitherto arresting epidemic disease among the Lancashire cotton-weavers, who are unfortunately suffering from famine at the present time.

If it were requisite, I could parallel this sad story by others from the history of this country and Continental states; but this will suffice for the lesson I wish to teach.

It is evident that of the two great causes of the Irish famine and pestilence of 1845-50, the failure of the staple animal and vegetable food of the people, man was powerless except in so far as he might mitigate the former. He could not turn back the seasons in their course, nor hold in check the fierce winds, nor bind the tempest-burdened clouds, nor compel the fervid sunbeam. He could solely bow with submission to the infinite Will which had, in its inscrutable wisdom, permitted the desolating blight to sweep over the land. But he could do much to stay the ravages of the deadly epizoötics. Here he was not altogether powerless. He might often save many flocks and herds. It is not in the midst of pestilence and famine, however, that this work has to be done, but in the times of plenty and of health. And it is the office of the veterinary practitioner to do this. This is his mission, a mission which elevates his calling beyond the restricted and ignoble aim of a mere money-getting art—elevates it from a simple commercial calling into an honorable and honoured profession.

When, therefore, we are called upon to deal with outbreaks of disease such as that of smallpox in sheep, it is not the immediate effects alone, but also the remote, that we have to consider; not the interest of the agriculturist solely, but of the community also—remember the latter consideration heightens the sense of duty arising from the former. In this manner you may in some measure estimate the true gravity of the

position of the veterinary surgeon who is called upon to advise in checking the first signs of an epizoötic, and with what careful thought and consideration, equally opposed to heedless impetuosity or to indecision, he should enter upon the duties intrusted to him.

But I think I hear some of you say, What have we to do with this? We have not come here to be taught the duties and functions of a veterinary philanthropist or transcendentalist; our object is to learn veterinary science, so that we may obtain an honorable and honest subsistence by its practice. We seek nothing higher. Now, it is because you have come here for this purpose, and because I and my fellow-professors are here for the sole object of aiding you in the best and most effective manner to achieve the purpose, that I have directed your attention to the widest scope and most dignified aspect of the veterinary practitioner's duties. The readiest and surest mode of obtaining success in the practice of any art is by excellence in that art. This —and the proposition, I imagine, cannot require argument to support it—is not to be attained by aiming at the least, but at the highest requirements of the art. Excellence is reached in proportion as the latter are neared, and it is the strife after them which gives vitality to preliminary studies and the subsequent practical application of them. In proportion as you apprehend the higher and more noble functions of your art, so in proportion you will ennoble your profession and yourselves, and obtain the confidence of your brother-students or practitioners and the public.

How, then, is this excellence to be secured? As of every other science, so of veterinary science, there is no royal road of approach. The road is a strait and narrow one, but it has been royally travelled. In this is your hope and encouragement. If you attempt to do other than enter by the unpretending portal and over the rugged and seemingly repulsive path of honest and straightforward endeavour, you will be liable to suffer the fate of the three unhappy individuals, two coming from the land of Vain-glory and one from the country of Conceit, who, as Bunyan tells us in his great vision, were met by Christian in the "narrow way." "Why came ye not in at the gate which standeth at the beginning of the way?" he said to the two former individuals, and they replied, "That to go to the gate for entrance was by all their countrymen counted too far about, and therefore their usual way was to make a short cut of it, and to climb over the wall, as they had done." The latter individual—"his name was Ignorance"—being asked a similar question,

answered, "As for the gate that you talk of, all the world knows that it is a great way off our country. I cannot think that any men in all our parts do so much as know the way to it; nor need they matter whether they do so or no, *since we have, as you see, a fine, pleasant, green lane that comes down from our country the nearest way.*"

Now, as we all well know, neither the two inhabitants of the land of Vain-glory—Formalist and Hypocrisy—nor Ignorance attained the object at which they aimed. They were fated to remain in outer darkness. When Formalist and Hypocrisy came to the foot of the hill *Difficulty*, "they saw the hill was steep and high," and that the narrow way lay right up it; but there were two other paths, one leading to the right and the other to the left, at the bottom of the hill, and the two pseudo-pilgrims, supposing that these two ways might meet again on the other side, "were resolved to go into those ways." "So the one took the way which is called Danger, which led him into a great wood, and the other took directly up the way to Destruction, which led him into a wide field, full of dark mountains, where he stumbled and fell, and rose no more." Ignorance, having entered the narrow way *beyond* the hill Difficulty, pursued his journey jauntily, puffed up in his own conceit, until he arrived at the very portals of Light; but when he sought to enter, he was bound hand and foot, and led away into darkness.

Never forget the trite but golden proverb, that "a short cut is oft the longest way." "*Compendia, dispendia,*" the Latins were accustomed to say; and Dean Trench has admirably observed, in his little work "On the Lessons in Proverbs":—"I cannot but think that for as many as are seeking diligently to improve their time and opportunities of knowledge, with at the same time little of either which they can call their own, a very useful hint and warning against an error which lies very near is contained in the little Latin proverb just cited. Not, indeed, for them only, but for all, and in numberless respects, it often proves true that a short cut may be a very long way home. Yet the proverb can never be applied better than to those little catechisms of science, those skeleton outlines of history, those epitomes of all useful information, those thousand delusive short cuts to the attainment of that knowledge which can, indeed, only be acquired by those who travel on the king's highway, on the old and, as I must call it, the royal road of patience, of perseverance, and of toil. Surely these *compendia*, so meagre and so hungry, with little food for the intellect, with less for the affections, we may style with the fullest right *dispendia*, wasteful, as they gene-

rally prove, of whatever time and labour and money is bestowed upon them."

Spenser's whole allegory of the entrance to the House of Holiness is equally applicable to the House of Knowledge. By the aid of humility and zeal alone will the tyro ever enter legitimately within its portals.

"Arrived there, the dore they find fast lockt;
For it was warely watched night and day,
For feare of many foes; but when they knockt,
The porter opened unto them streight way.
He was an aged syre, all hoary gray,
With looks full lowly cast, and gate full slow,
Wont on a staffe his feeble steps to stay,
Hight Humiltà. They passe in, stouping low;
For streight and narrow was the way which he did show.

"Each goodly thing is hardest to begin;
But entered in a spacious court they see
Both plaine and pleasaunt to be walked in;
Where them does meete a francklin, faire and free,
And entertaines with comely courteous glee;
His name was Zele, that him right well became:
For in his speaches and behaveour hee
Did labour lively to expresse the same,
And gladly did them guide, till to the hall they came."*

Let, then, the habits of mind thus taught by our great allegorical poet be striven after by you. For the rest, the great secret of success in the study of your profession may be summed up in one little, but all-important, word, to wit, ATTENTION. This is the true secret of progress in knowledge, whether of science or art;—this is the great arcanum of success. Study the lives of all those men who have most benefited humanity and have made for themselves the largest and noblest fame, and you will find that each attributes to patient attention the greatness of his success. It is this attention which may link the loftiest to the lowliest mind, and which often enables the dullest plodder, in the end, to tread upon the skirts of the most brilliant and far-flying thinker. I would impress this truth upon you as fully as practicable. It is, I reiterate, the great secret of your success as learners. "Studies teach not their own use," says Bacon, "but there is a wisdom without them and above them, won by observation"—that is—by careful and persistent attention.

"The greater capacity of continuous thinking that a man possesses," Sir William Hamilton writes, "the longer and more steadily can he follow out the same train of thought, the stronger is his power of attention; and in proportion to

* *The Faerie Queene*, B. I, c. x, s. vi and vii.

his power of attention will be the success with which his labour is rewarded. All commencement is difficult, and this is more especially true of intellectual effort. When we turn our view for the first time to any given object, a hundred other things still retain possession of our thoughts. Even when we are able, by an arduous exertion, to break loose from the matters which have previously engrossed us, or which every moment force themselves on our consideration—even when a resolute determination, or the attraction of the new object, has smoothed the way on which we are to travel—still the mind is continually perplexed by the glimmer of intrusive and distracting thoughts, which prevent it from placing that which should exclusively occupy its view in the full clearness of an undivided light. How great soever may be the interest which we take in the new object, it will, however, only be fully established as a favorite when it has been fused into an integral part of the system of our previous knowledge and of our established associations of thoughts. This can only be accomplished by time and custom. But if we are vigorous enough to pursue our course in spite of obstacles, every step, as we advance, will be found easier; the mind becomes more animated and energetic; the distractions gradually diminish; the attention is more exclusively concentrated upon its object; the kindred ideas flow with greater freedom and abundance, and afford an easier selection of what is suitable for illustration. At length our system of thought harmonises with our pursuit. The whole man becomes, as it may be, philosopher or historian or poet. He lives only in the trains of thought relating to this character. He now energises freely and, consequently, with pleasure, for pleasure is the reflex of enforced and unimpeded energy. All that is produced in this state of mind bears the stamp of excellence and perfection."

Helvetius also justly observes that the very feeblest intellect is capable of comprehending the inference of one mathematical position from another, and even of making such an inference itself. Now, the most difficult and complicated demonstrations in the works of a Newton or a Laplace are all made up of such immediate inferences. They are like houses composed of single bricks. No greater exertion of intellect is required to make a thousand such inferences than is requisite to make one, as the effort of laying a single brick is the *maximum* of any individual effort in the construction of such a house.

Thus, the difference between an ordinary mind and the mind of a Newton consists principally in this, that the one is capable

of the application of a more continuous attention than the other; that a Newton is able without fatigue to connect inference with inference in one long series towards a determinate end, while the man of inferior capacity is soon obliged to break or let fall the thread which he had begun to weave. This is, in fact, what Sir Isaac, with equal modesty and shrewdness, himself admitted. To one who complimented him on his genius he replied that, if he had made any discoveries, it was owing more to patient attention than to any other talent.

There is little analogy between mathematics and play-acting, but the great Mrs. Siddons, in nearly the same language, attributed the superiority of her unrivalled talent to the more intense study which she bestowed upon her parts. . . . Like Newton, Descartes arrogated nothing to the force of his intellect. What he had accomplished more than other men that he attributed to the superiority of his method, and Bacon, in like manner, eulogises method, in that it places all men with equal attention upon a level, and leaves little or nothing to the prerogatives of genius. Nay, genius itself has been analysed by the shrewdest observers into a higher capacity of attention. 'Genius,' says Helvetius, whom we have already quoted, 'is nothing but a continued attention' (*une attention suivie*). 'Genius,' says Buffon, 'is only a protracted patience' (*une longue patience*). 'In the exact sciences, at least,' says Cuvier, 'it is the patience of a sound intellect which truly constitutes genius.' And Chesterfield has also observed, 'that the power of applying an attention, steady and undissipated, to a single object, is the sure mark of a superior genius.'"*

Mr. Edgworth, Mr. Smiles tells us in his charming book, '*Self-help*,' "entertained the opinion that many of the great differences of intellect which are found in men depend more upon the early cultivation of the *habit of attention* than upon any great disparity between the powers of one individual and another;" and we read elsewhere in the same work—that "Dalton, the chemist, always repudiated the notion of being 'a genius,' attributing everything which he had accomplished to simple industry and accumulation.

"John Hunter said of himself, 'My mind is like a bee-hive; but full as it is of busy and apparent confusion, it is yet full of order and regularity and food collected with incessant industry from the choicest stores of nature.'

"We have, indeed, but to glance at the biographies of great men to find that the most distinguished inventors,

* 'Lectures on Metaphysics,' vol. i, p. 258.

artists, thinkers, and workers of all sorts, owe their success, in a great measure, to their indefatigable industry and application. They were men who turned all things to gold, even time itself. Disraeli the elder held that the secret of all success consisted in being master of your subject, such mastery being attainable only through continuous application and study. Hence it happens that the men who have most moved the world have not been so much men of genius, strictly so called, as men of intense mediocre abilities, untiring workers, persevering, self-reliant, and indefatigable. Not so often the gifted or naturally bright and shining qualities as those who apply themselves diligently to their work, in whatever line they may be. 'Alas!' said a widow, speaking of her brilliant but careless son, 'he has not the gift of continuance.'

"Wanting in perseverance, such volatile natures are outstripped in the race of life by the diligent, and even the dull.

"Hence a great point to be arrived at is to get the working quality well trained. When that is done, the race will be found comparatively easy. We must repeat and again repeat, facility will come with labour. Not even the simplest act can be accomplished without it, and what difficulties it is found capable of achieving! . . . ."

I need not add anything, I think, to enforce the suggestions for your guidance contained in the foregoing quotations. I would, however, commend Mr. Smiles's most instructive little work to your notice. Read it, and from its pages you will learn invaluable lessons, which may prompt you to the best and most economical use of your time, not only here, but throughout life.

I may next observe, with reference to your studies within this institution, that Professor Spooner will induct you into a knowledge of the anatomy, physiology, and pathology of the horse; that Professor Varnell will aid you in the study of descriptive anatomy, and also of hospital practice; that Professor Tuson will unravel the mysteries of chemistry, and guide you in the obtainment of a knowledge of materia medica; that Mr. Pritchard will teach you practical anatomy; and that to my lot it will fall to help you, in the best manner I can, to acquire a knowledge of the anatomy, physiology, and pathology of other domesticated animals. I shall leave it to my colleagues to point out, at the commencement of their respective courses of lectures, such works as are most fitted to be of use to you as manuals of the different subjects to be studied, and such special requirements as may best enable you to profit by their teachings. I shall adopt a

similar course myself. But I can justly add here one or two additional items of advice which may be of profit to you.

Do not imagine that in the brief space of time set apart for your collegiate education you can do more than master the A B C of the profession. Our object here is to teach you thoroughly and well the rudiments of veterinary science, and to indicate to you in what manner you may best mature those studies in actual life. We do not profess more. "One needs only to know the twenty-four letters of the alphabet in order to learn everything else that one wishes," said Edward Stone, the talented gardener's boy, in explanation of his learning. This is the true light in which to view your studies here. You should seek to master the veterinary alphabet, as the sound foundation upon which to erect any loftier structure of knowledge. Unless this foundation be well laid, no superstructure can be stable, and the time required to be spent in the pursuit of knowledge here is such as may enable you thoroughly to master the alphabet—not more. Do this, however, and the rest will be easy.

With such hints as we may give you, with the aid of the many valuable works and monographs which exist on veterinary science, and such opportunities of practical observation as may be afforded you, there will be the widest scope for the exercise of your highest capabilities and the greatest probability of these being applied to a good and profitable end. But if you conceive that, when you leave these walls, you have exhausted or entirely mastered the knowledge of your profession, you will be in the unfortunate condition of an individual who, when he has learned the alphabet, the first principles of spelling, and in what fashion to make letters, conceives that he is therefore to be regarded as a facile reader and writer; or of an unhappy personage who, when he has overcome the difficulties of the numeration table, thinks that he has secured all that is necessary for solving the profoundest arithmetical questions.

Now, without an accurate acquaintance with the anatomy and physiology of domesticated animals, you will not be able rightly to apprehend or apply the knowledge of their diseased conditions. Pathological principles require for their full comprehension a competent acquaintance with healthy structure and function. This is to be obtained solely in the dissecting-room, and in the observation and careful study of the habits and manners of the animals you will be called upon to treat. Do not suppose that if you obtain a sufficient knowledge of well-defined diseases, and the best methods of treating them,

that you have mastered all that is needed for the successful practice of your art. You may have acquired what is necessary for its empirical practice, but not more. As in human medicine, so in veterinary, it has been this looking for the most patent and immediate results of practice that has been the greatest impediment to progress. Diseases will not be limited by definitions and typical descriptions, and the necessarily circumscribed experience of a hospital will not include all the varieties of the same form of disease found in the stall, the fold, and the field.

A thorough familiarity with the structure and functions of the different parts of the frame and of the habits of an animal, will alone enable you to apply satisfactorily the knowledge of disease which you may obtain, or to contend with any new forms of disease that may arise, or to impede the progress or mitigate the effects of those disastrous epizoötics to which I have referred. A proper application of preventive medicine in flocks and herds is only possible upon an accurate acquaintance with all that relates to the feeding, rearing, breeding, stabling, folding—nay, to the entire habits and requirements of domesticated animals.

Preventive medicine has been, of all the different divisions of veterinary art, the most neglected in this country, and it is the least amenable to routine practice. It is, however, that branch of veterinary practice which, perhaps, most needs attention at the present time, and which promises best for the welfare of the profession, the practitioner, and the community. But a wide application of preventive medicine must be almost entirely dependent upon the tact and knowledge of the individual practitioner. We have, in the practice of our art, to deal with many ignorant and impracticable people—herdsmen, shepherds, grooms, and too often even masters—who will see no benefit except such as may be immediately before them, and who are guided by no high estimate of duty in their business dealings. Our best efforts are liable to be foiled by these men—men who have an indomitable faith in the value of their own "experience." There is only one way in which such persons can be beneficially influenced, and that is by showing so complete a familiarity with all that relates to their most minute duties, and the requirements of the stock with which they may have to deal, as to compel their respect for ourselves and our opinions. This once done, the path is clear.

But if I urge thus earnestly the study of the anatomy and physiology and habits of domesticated animals, do not suppose that I elevate these subjects above that of disease. I

urge their study as of equal importance with the study of morbid states, not superior.

Neither subject must be pursued to the exclusion of the other. In the hospital every facility will be afforded you for obtaining a practical acquaintance with disease, while the theoretical knowledge will be taught from this chair. As the dissecting-room is the place for the just study of anatomy, so is the hospital for the study of disease. Here you will have whatever help my fellow-professors and myself can give you in distinguishing the nature and observing the treatment of maladies; and you would do well to remember that time and opportunity now wasted can never be recalled. When you leave this College it will be for the active duties of your profession—duties which are often incompatible with, or destroy that persistent attention which is requisite to master the rudiments of pathology. I would earnestly entreat you, then, for your own sake, for the sake of your professors, and for the sake of the College, whose reputation is now involved in your success, to let no imputation of neglect rest upon you.

And now, gentlemen, in bringing these observations to a conclusion, I would express a hope that I may, in some measure, have conveyed to you the impression that the greatest personal good and practical benefit are concomitants of the highest professional excellence, and that this is to be sought or obtained only by striving at the loftiest aims of the veterinary art. I might have pointed out to those who would seek the highest scientific honours, the vast field open to them in comparative anatomy, physiology, and pathology, but I have preferred to keep to that aspect which is most consistent with the everyday life and work of the profession.

Let me note here an additional word or two of advice and caution, touching upon this latter object. The public justly look to the veterinary practitioner for the chief education of those who have the care of our domesticated animals in habits of humanity. From thoughtlessness, ignorance, and brutality, too often the ordinary treatment of these animals is of the most cruel description. It is for us, by example and precept, to take every opportunity of inculcating humane treatment. Nothing can be more certain than, that we best consult the commercial value of every kind of domesticated animal by such treatment. But a more noble reflection than this ought to influence us. Has it not been said by the INCARNATE that not even a sparrow falls to the ground without the Divine permission? There is a moral responsibility involved in the care of animals which is too frequently for-

gotten, but which is not the less real and solemn to the Christian.

There are also high considerations, naturally arising out of the study of veterinary science, which I may not pass over in silence. Cicero, writing of the variety of animals and their diverse habits as proofs of the existence of a Deity, says—

"Let us proceed from celestial to terrestrial things. What is there in them which does not prove the principle of an intelligent nature? . . . What a vast variety is there of animals! and how wonderfully is every kind adapted to preserve itself! Some are covered with hides, some clothed with fleeces, and some guarded with bristles; some are sheltered with feathers, some with scales; some are armed with horns, and some are furnished with wings to escape from danger. Nature hath also liberally and plentifully provided for all animals their proper food; I could expatiate on the judicious and curious formation and disposition of their bodies for the reception and digestion of it, for all their interior parts are so framed and disposed that there is nothing superfluous, nothing that is not necessary for the preservation of life. Besides, nature has also given these beasts appetite and sense, in order that by the one they may be excited to procure sufficient sustenance and by the other they may distinguish what is noxious from what is salutary. . . ."*

Shall it be said that the Christian veterinary student is less open to these higher teachings of nature, which come so immediately under his eye, than the pagan philosopher? Well did the Psalmist sing, and so also let us sing—

"BEASTS AND ALL CATTLE—WORMS AND FEATHERED FOWL—YOUNG MEN AND OLD—PRAISE THE NAME OF THE LORD, FOR HIS NAME ONLY IS EXCELLENT AND HIS PRAISE ABOVE HEAVEN AND EARTH."

A CASE OF TUMOUR IN THE BRAIN OF A HORSE.

By W. P. TOLL, M.R.C.V.S., Lichfield.

THE subject of the following report was a bay cart-horse, nine years old, in good condition, the property of a gentleman in this neighbourhood, which was brought to me for treatment on Saturday, the 6th of September last.

* 'On the Nature of the Gods,' Bk. 2, § xlvii.

The waggoner who brought the horse informed me that on last Tuesday night the animal had been exposed to very wet and cold weather, being out at grass. When fetched up on the Wednesday morning, he appeared dull, but, nevertheless, fed as usual. He worked very dispirited all day, and would not turn on the off side. In the evening he was turned out to grass again, but instead of feeding as the other horses did, he commenced walking round a space of about forty yards' diameter, which he continued to do for about a quarter of an hour or twenty minutes, always turning to the near side. After this he began to feed, and was then left for the night. The waggoner went to the field early the next morning, and found him with the other horses, still feeding, but as he was not wanted that day he remained at grass, nothing further being noticed respecting him.

On Friday morning he was fetched up for work, and while feeding he was noticed several times to start back very suddenly from the manger, throwing up his head and snorting as if frightened. The waggoner, not being able to account for this, let him loose, that he might go into the yard, but instead of doing this he ran his head against the wall, as if he could not see. When taken to the manger again he commenced feeding, but occasionally started back. On being harnessed for work, the man had some difficulty in putting on the bridle, and he observed that while the horse was at plough he stumbled very much and did not keep to the furrows. He also appeared to be alarmed when spoken sharply to, or when touched with the whip. He went on in this way until eleven o'clock, when the man was wanted among the cows, and the horses consequently were unhooked and turned to grass, no further notice being taken of this one. When brought to the stable on the next morning, and whilst feeding, the the same symptoms which had been previously noticed reappeared, in consequence of which it was decided that he should be sent to me.

On examination, I found that the least noise caused him very great excitement. He could not stand still, nor would he walk into the stable. The pulse was 70 in number, and although strong and firm to the feel, was slightly intermittent. The mucous membranes were unaffected.

From these symptoms, together with the waggoner's report, I concluded that the animal was suffering from brain disease, and that it was probably associated with some inflammatory action. Acting upon this opinion, I bled him copiously, extracting about ten quarts. The blood was at first very dark in colour, but nevertheless it flowed freely. The bleeding

was effected as the horse walked about the yard. The excitement somewhat abated and the pulse became softer, but still he would not allow me to pin up the orifice until he became faint from the loss of blood. I now clothed him up, and allowed him to stand in the yard for an hour or more, the weather being very fine. He now walked into a loose box without difficulty, and partook of a bran mash very readily. The following ball was given:

℞ Aloës Bds. spt., ʒvss;
Hyd. Chlorid., ʒj;
Pulv. Opii, ʒiss;
Massa com., q. s. M. ft. bolus.

September 7th, 8 a.m.—General symptoms favorable. More quiet. Pulse 50 and soft. Takes mashes and chilled water freely. Bowels acting, but apparently not from the medicine.

A sedative ball was given.

8 p.m.—Much the same as this morning.

8th, 6 a.m.—Appears more dull; eyelids swollen and heavy. He occasionally walks round the box. The bowels are acting, but not freely. He takes his mashes well.

Repeat the medicine.

10 p.m.—No change since morning.

9th, 7 a.m.—More dull, pressing his head firmly against the corner of the manger. Eyes look very heavy. He moves reluctantly, but occasionally wanders round the box. He still takes mashes, but not so freely as before. The bowels are not acting, and on examination *per rectum* a large quantity of hardened fæces were found, which were removed, and a glyster thrown up.

7 p.m.—He had lain down for a couple of hours, resting his nose on the ground. On getting up he was very restless, and we could not succeed in keeping him still. As he had already bruised his head and face, to prevent further mischief I put him into slings, in which he rested tolerably quiet, but pressed forward on the breast-piece, apparently quite unable to support his head. To assist him in keeping up his head I attached a rope to each side of the head-stall, and fastened these to a beam above.

The pulse being quick and irritable, the following medicine was given in ball:

℞ Pulv. Opii, ʒj;
Hyd. Chlorid., ʒss;
Massa feb., q. s. Ft. bolus.

10th, 7 a.m.—No improvement. Eyes and nose swollen.

Head resting entirely on the head-stall, as he presses heavily forward on the breast-piece. The fæces are soft, but there is no effort made to pass them.

He still takes a little mash and chilled water.

Cooling lotion was applied over the head and face, and some sedative medicine administered.

8 p.m.—Much the same.

11th, 7 a.m.—Swelling of the head less. No action of the bowels, but fæces soft. Takes a little mash and some fresh clover, which I had partially dried before the fire.

9 p.m.—Swelling abating. Pulse quick. Feeds pretty well on the clover.

12th, 7 a.m.—Improving. Takes clover freely. Stands better in the slings, and looks more lively. Swelling nearly all gone from the head.

10 p.m.—Apparently going on favorably. Appetite good. Sits back in the slings, and holds up his head.

13th.—Still improving. Takes pretty well of clover.

The fæces are hard, but are naturally passed. I threw up an injection, and repeated the medicine, adding thereto Hyd. Chlorid. ʒss.

8 p.m.—Much the same. Repeated injection.

14th, 8 a.m.—Appears to be much nauseated. Refuses everything. Bowels have acted slightly, the physic evidently beginning to operate.

10 p.m.—The bowels are acting freely. No appetite.

15th, 7 a.m.—Bowels acting freely. Small quantities of water thickened with wheat-flour were given him frequently.

8 p.m.—"Physic setting nicely." Takes a little mash mixed with a few boiled oats.

16th, 8 a.m.—Going on favorable. Takes freely of the mash and boiled oats, and also a little of the dry clover.

I had him removed from the slings.

From this date up to the 24th he went on favorably, feeding well and taking a little exercise every day.

On the 22nd he was so much improved as to be able to walk home, a distance of five miles.

25th.—I visited my patient to-day, and found him dull and dispirited, not feeding so well, and occasionally wandering round the box. The pulse was soft and quiet, and the bowels freely acting. Gave—

℞ Pulv. Opii, ʒj;
Hyd. Chlorid., ʒss;
Mass. com., q. s., in a ball.

26th, 8 a.m.—No improvement.

About the middle of the day he became very much excited,

plunging violently about the box. I again put him into slings; but as he would not rest in them, I had very soon to take him out again.

27th.—He has been tolerably quiet during the night, and had stood with his head resting against the wall. He takes a little clover and a few carrots. The bowels are not acting, and, consequently, I removed the fæces, threw up injections, and likewise gave five drachms of cathartic mass.

28th.—Not so well. More excited. Refuses to take anything. Stands with his head pressing against the wall.

29th.—Much the same. Head more swollen, from pressing it against the wall. Pulse increased to 75, and feeble. Breathing slow and heavy. No action of the bowels, although the fæces are soft.

On this visit I was accompanied by my old college friend, Mr. John Markham, of Rugby, who agreed in my opinion that some pressure on the brain was the cause of all the mischief, and that but little hope could be entertained of a favorable result.

We attempted to relieve the head by opening the facial veins, and applying tepid water frequently to the swollen parts.

30th.—All the symptoms are more aggravated. Refused everything, and will not bear to be moved back from the wall. There is also no action of the bowels. Towards the afternoon he became so much worse that the owner determined to have him destroyed.

October 1st.—I made arrangements to have the horse brought to Lichfield, that I might make a *post-mortem* examination, but I had no opportunity of doing so before Thursday morning. All the abdominal and thoracic viscera were healthy. On removing the head at the occiput about an ounce of a coffee-coloured fluid escaped on cutting through the theca vertebralis. After detaching the head I removed the frontal bones, and on sawing through them on the near side, I unfortunately opened what appeared to be an abscess, when about an equal quantity of a similar coloured fluid escaped. On lifting up the bone I found the brain so much diseased that I at once determined to forward it for your inspection, the case being a very interesting one, and, I presume, also one of rare occurrence.

It should be observed there was never any symptom of paralysis from the first of the animal's illness up to the time he was destroyed. It is also not a little remarkable that he should get so much better as to go on satisfactorily

for more than a week, feeding during the time equally as well as any horse could be wished to do in health. He likewise was able to take some exercise every day, and although his illness lasted a month, he did not loose much flesh.

To what can the formation of the abscess be attributed? Could it have resulted from the exposure to wet and cold, as spoken of by the waggoner?

OBSERVATIONS ON THE ABOVE CASE, BY PROFESSOR VARNELL.

The roof of the skull had been removed, and the brain partly exposed previous to the specimen coming into my possession, in the doing of which the encephaloid membranes were considerably torn. The cranial portion of the head had also been separated from the facial by a transverse section, which unfortunately had been made so near to the cranial cavity that the olfactory bulbs were cut through, thereby allowing any fluid which might have been contained in the lateral ventricles to escape, a free communication existing between the lateral ventricles and the interior of the olfactory bulbs, which is seldom alluded to by anatomists.

The brain was first carefully taken out of the cranium, but from its disorganized condition, and there being no chance of its being preserved as a pathological specimen, a circumstance much to be regretted, it was freely cut up to investigate the morbid changes that had taken place.

General appearances.—The veins of the pia mater were filled with blood, which gave the surface of the brain a darkish appearance. The posterior part of the left hemisphere of the cerebrum, which was much sunken in, was of a dirty yellow or a yellowish-brown colour. It was also very soft in consistence. Resting upon and partly imbedded in this portion of the brain, was an irregular-shaped and nodulated tumour, as large as a moderate sized egg. The outer covering of the tumour was connected by continuity with the dura mater, and on examining its interior it was found to contain a quantity of coagulated blood. The tumour had either been accidentally opened or its outer coat had yielded to the pressure of its contents, which, on referring to Mr. Toll's description, I find occurred when he was removing the roof of the skull. The greater part of the dura mater, with the longitudinal and lateral sinuses, having been removed from the cranial cavity with the brain, I next proceeded to detach this, by first raising the falx cerebri from the longitudinal fissure and the tentorium from the transverse

fissure. In doing this I observed that the anterior wall of the left lateral sinus apparently formed the tumour alluded to, which opinion was confirmed by following the course of the serous lining membrane of the superior longitudinal and right lateral sinuses into the interior of the sac. Some little care was necessary in dissecting the enlargement from the brain, in which, as before stated, it was not only partially imbedded, but also firmly adherent by its outer surface. The tumour itself extended as high as the torcula Herophili, and as low down as where this body joins the cavernous sinus at the base of the brain. After removing the tumour a considerable space was left in the posterior part of the hemisphere, covered, of course, by the pia mater and the arachnoidial membranes. On cutting through these membranes, which at this part were much increased in thickness and also extra vascular, a large cavity was exposed, the anterior part of which extended into the lateral ventricle. The surface of this cavity was of a darkish-yellow colour, and was covered with a cream-like matter, as far as consistence is concerned, but in colour like the substance it rested upon. The plexus choroides were but slightly altered from their normal state, excepting that they were a little enlarged from infiltration. On the surface of the descending cornu, near its commencement, numerous petechial spots of effused blood existed, and similar ones were also found on the surface of the corpus striatum, around which a slight tinge of a dirty red colour was observed. Such were the principal lesions noticed in the parts under consideration.

Remarks.—The above case is highly interesting, both in a physiological and also in a pathological point of view. Perhaps more, and very likely better, explanations of the functions of the brain have depended upon observing the effects of pressure from tumours, &c., than upon any experiments founded on vivisection. If this is true, and I have reason to believe it to be so, we can make use of disease in studying the science of physiology. When this organ or any of its parts are functionally deranged, it should lead us first to the brain itself, and then, by the same aid, to the particular part of the organ that may happen to be functionally interfered with.

Knowledge of this kind would also assist in conducting the mind to the proximate cause of the disease, which, although we might not be able to remove, nevertheless we should be in a better position to form a correct diagnosis of, and also to prognosticate with a greater degree of certainty what its ultimate result might be. Carrying out the ideas thus

briefly suggested to their fullest extent, would show the mutual dependence these two sciences, viz., physiology and pathology, have upon each other in affording explanations of normal or abnormal phenomena.

In the case now under consideration the only part of the brain which was primarily, or at any time during the development of the tumour, affected, was the posterior lobe of the left hemisphere of the cerebrum; secondarily, other parts doubtlessly became involved. The thalamus opticus of the same side was visibly diminished in size, and other parts of the brain might have been structurally involved, but could not be detected by the unaided eye. There was not the slightest evidence that the cerebellum had in any way suffered from the pressure of the tumour.

The facts developed by the *post-mortem* examination, to be of any practical use, should correspond, to a certain extent, with the symptoms observed previous to death, or otherwise a knowledge of their existence would be of no avail in diagnosing similar cases, or, on the other hand, at arriving at correct physiological inferences.

They are, however, of great use, and the value of making *post-mortem* examinations, and faithfully recording the morbid changes, together with the symptoms observed before death, must be apparent to every one who takes an interest in such matters.

We will briefly review the symptoms of this case, as described by Mr. Toll, the most prominent of which, during the first eighteen or twenty days, were *stupor*, extreme dulness, and a disposition to turn to one side only. The first two of these symptoms, with that of forcing the head persistently against the manger or wall, might be understood as indicative of functional derangement of the brain, arising from chronic indigestion ("stomach staggers"); but when we take into consideration the peculiar symptom of turning only on one side, we are at once drawn to the brain itself; and from that symptom alone would be disposed to view the disease as organic in its nature. The torpid state of the horse's bowels, and the difficulty of their being acted on, even by large doses of cathartic medicine, are quite diagnostic of cerebral disturbance.

The case is even more interesting to the veterinary pathologist, and its physiological bearing more apparent, when placed in juxtaposition with the following. A few years ago a friend of mine, Mr. T. W. Gowing, of Camden Town, published a case in the *Veterinary Record* of a horse, in which a tumour of a similar character projected into the

cranial cavity, but instead of pressing upon the cerebrum its effects were upon the cerebellum, a large portion of which had become absorbed by the pressure it had imparted. Now in this case there was at first partial paralysis of muscular power, which eventually became so general that the horse was obliged to be destroyed. On the other hand, in Mr. Toll's case muscular paralysis was not present, but volition was partially destroyed, as was evidenced by the symptoms exhibited by the animal. If it be asked, "what can the formation of the tumour be attributed to?" I would reply that the question cannot be answered so positively as could be wished, and to attempt it, even conjecturally, would, in my opinion, tax the ingenuity of the pathological anatomist. That its development was very slow is indicated by the loss of brain substance—the whole of the gray, with a portion of the white fibrous part beneath it, was removed by absorption—and also by the character of the tumour itself. Even the coagula of blood in the interior of the tumour were evidently of long standing, which was especially indicated by their stratified appearance—these strata being alternately light and dark coloured. Their edges also were rounded, and many of them partially broken up.

We might advance several theories from the arrestation of the blood in this sinus leading to the bulging out of the cavity anteriorly, so as to form a sort of sac, without any of them being the right one. I therefore prefer to leave the question of the original cause of the formation of the tumour an open one; but it having taken place, it is comparatively easy to understand how the blood, after being partially arrested in the sinus, could coagulate, even in several portions, each of which would gradually become larger, by the surfaces being continually bathed by blood in its passage through the sinus. I can conceive that in this way the tumour gradually increased in size until it assumed its full magnitude, while its pressure upon the cerebrum would account for the loss of structure of that organ, and which, like the formation of the tumour, was a very slow process. I have no doubt that the structural disease thus produced had long affected the volitional powers of the horse, but not to an extent to be detected by an ordinary observer, until about the 6th of September, when the waggoner first noticed something wrong with the animal, which was attributed by him to exposure to wet and cold. I think it probable that this exposure had something to do in hastening the development of the acute symptoms, but none whatever in the production of the tumour.

With regard to the treatment, now that we have seen the cause of the symptoms, we can understand why it was not attended with success. The case was one in which a correct diagnosis was not likely to be made—the cure impossible. Mr. Toll correctly viewed the case as an affection of the brain, and directed his treatment accordingly, and its influence in mitigating some of the most urgent symptoms was very remarkable; indeed, so much so that the horse was sent to the owner so much improved that it was thought he might recover. The symptoms, however, soon returned, even in a more aggravated form, as we should expect they would have done now that we are familiar with the nature of the affection.

I have observed in two or three cases of this character similar temporary beneficial effects from bloodletting and purging, which, asinthis case, may have depended upon the removal of a certain amount of pressure from the brain.

I feel assured the readers of the *Veterinarian* will agree with me that the case is highly interesting, and that our thanks are due to Mr. Toll for so valuable a contribution.

BOTANY AS APPLIED TO VETERINARY SCIENCE.

By W. Watson, M.R.C.V.S., Rugby.

(*Continued from p.* 577.)

Among the plants yet to be described, which are extensively cultivated as food for animals, will be found the *Faba vulgaris* (bean) and *Pisum latiorum* (pea). They both belong to the class of Exogens, to the sub-class Calyciflora, and to the natural order Leguminosa, all of which have been previously described when noticing the clovers, &c. The natural order Leguminosa, it will be remembered, may be always recognised by the flowers having a papilionaceous (or butterfly-shaped) corolla, with ten stamens, which are either monadelphous or diadelphous, and the fruit being a legune or pod, containing seeds usually destitute of albumen.

"*Faba vulgaris* (bean).—*Racemes* axillary, 2-4 flowered, very short. *Leaflets* terminated by a mucro, the upper in two pairs, elliptical, obtuse. *Pods* leathery and tumid. *Seeds* oblong, straw-colour, with a black hilum."—Lindley.

The above description of the garden bean will equally apply to the field bean, which is known by the name of

Faba vulgaris arvensis. This well-known plant has been cultivated from a very early period both by the Greeks and Romans, by whom it was held in great veneration, on account of the supposed resemblance in the shape of its legume or pod to Noah's ark. "It is indigenous to Egypt, Barbary, and Morocco, and is believed to have been originally introduced from the first of these countries into Great Britain. There are a great many varieties, both in field and garden cultivation, a rich strong, loamy soil being best adapted for their growth, on which they yield a large supply of very valuable food for many of our domestic animals. As food for horses they should be given when sweet, sound, and not less than a year old, as when given new they not unfrequently produce indigestion, flatulent colic, &c., and in some instances laminitis has supervened upon large quantities being partaken of. When given to horses without being mixed with other corn they should always be used with bran, to prevent their constipating effects.

"*Pisum sativum arvense* (gray or field pea).—*Stipules* ovate, half-cordate, toothed at the base. *Leaflets* in two or three pairs, ovate, crenulated. *Peduncles* with about two flowers. *Seeds* angular, impressed, brown, speckled. *Flowers* purple." —Lindley.

This, like the bean, belongs to the vetch tribe, of the natural order Leguminosa, and was introduced into this country from the south of Europe. There are a great many varieties in cultivation, all thriving best on a well-drained, sandy loam. As food for horses they much resemble beans. The following analysis by Dr. Voelcker will show the comparative value of these two kinds of food:

	Peas.	*Field Beans.*
Nitrogenized or flesh-forming constituents .	23·4	23·3
Substances free from nitrogen, fitted to support respiration and to lay on fat:		
a. Starch, sugar, fat, &c. . . .	50·0	48·5
b. Woody fibre	10·0	10·0
Ash (bone materials)	2·5	3·4
Water	14·1	14·8

With this I shall conclude my observations on the botanical characters, &c., of plants which yield a supply of food for our domestic animals; there are many more plants yet which are, to a certain extent, cultivated for the same object, but which can be more conveniently noticed at a future time under another head. In my next communication I purpose commencing the consideration of another division of the subject, viz., plants which are poisonous or prove otherwise

injurious to animals. I trust that in my foregoing remarks I have not altogether lost sight of the object I had in view, viz., to bring under notice of the profession, in as plain a manner as possible, the claims which the science of botany has upon the attention of the veterinary surgeon.

That it has not been devoid of interest the many communications I have received from different members of the profession fully testify. That it is an interesting and beautiful science all must admit, and that it is practically useful few will deny. If any further illustration of the latter fact were necessary, I would, in conclusion, direct especial attention to the very interesting account in the *Veterinarian* for August of a series of investigations carried out by Professors Simonds, Voelcker, and Buckman, into the nature and causes of "splenic apoplexy" amongst cattle and sheep, and in which the *botanical* examinations of Professor Buckman have left little doubt that this very fatal affection depended upon the peculiar herbage growing in the pastures in which the animals subject to this disease had been kept. Botany, then, has claims upon our attention in this department, and we may rest assured that its practical value will every day be more apparent in carrying out investigations as to the origin of many diseases which are at present but little understood, and which, in many more instances than is at present supposed, will be found more or less intimately connected with the food upon which herbivorous animals are fed.

(*To be continued.*)

EXAMINATION OF VETERINARY PRACTITIONERS.

Messrs. Editors,—When I wrote my letter relative to the system of registration which is on the *tapis* I did not imagine that it would have called forth the numerous remarks from practitioners which it has done, as I only intended my observations to apply to those who had spent their time and their money at college without obtaining their diploma, as I deemed it at that time, and now so deem it, a species of injustice to class these *unfortunates* in the same category as those who have never had a collegiate education, and who are generally styled practitioners. As to the idea, which has been mooted by some in your columns, that they might be allowed to undergo an examination without graduating, I regard it as ridiculous; for, in the first place, as you have observed, it would be unjust towards

those who have passed the ordeal, and, in the second place, there is not a practitioner in the country who has not graduated at college who could answer five questions on the principles of the profession, although he may have been able to earn hundreds of pounds every year, and to diagnose the generality of diseases correctly. I know how it used to be with myself previous to graduating. I then did that which others before me had done, and not because I knew *why* I did it. I ordered hot and cold fomentations as now, but I knew not the principles which should govern these operations; true, I had a vague idea that these would lower inflammatory action, but what inflammation *was*, and how these could effect its reduction, I knew not, although I could talk glibly enough of evaporation and the like. If you asked me how aloes acted, I could tell you that they produced purgation. But if you had asked me how the difference in purgation was produced by Epsom salts, aloes, calomel, oils, &c., I should have been at a loss to tell. The history of the heart's action I knew not; and although something was known of digestion, learnt from such works as the 'Stomach, and its Difficulties,' yet the why and because of the definite arrangement of all the parts necessary for the completion of the process was not understood, neither could it be, or else the labours of a Spooner, a Simonds, a Morton, and a Varnell, are well-nigh worthless. No; our old practitioners work from experience, but not from principle. They live in a fog of physic, and rob dame Nature of the glory of a cure. This is my experience both of myself and of them, and although the educated man cannot often make it apparent that he is superior, yet he has the satisfaction of knowing what he is aiming at, and for this he must thank his college education. Then, reiterating my former statement, I say, do not knock the plucked birds entirely off the perch by *any* system of registration, for I have done everything which could be done in my case to become one of you. I presented myself for examination a second time, but was told that I must graduate again before being eligible, although mine had in the interval been a life of severe work and study. All I say is, let us try to be just to those who have not been fortunate.

Yours truly,

A GRADUATE FORTY YEARS OLD.

To the Editors of 'The Veterinarian.'

THE ORIGIN OF VACCINATION.

A Communication from Mr. G. Jesty, Crookham, near Farnham.

The serious disease of smallpox in sheep at this season of the year, when rams are being put to the ewes throughout the kingdom, is much to be deplored; for, should the malady continue, I fear the ewes may not prove pregnant, or if so, that alarming results will ensue during the lambing season.

It is a satisfaction to know that you are rendering your practical services with the most beneficial effects, by means of inoculation, the good results of which we have a notable instance of in Mr. Parry's flock.

I must beg to observe that I perfectly concur with your opinion on this subject; and, although Professor Gamgee entertains a different opinion, yet he does not give any satisfactory reasons for forming such on this particular point.

I enclose you a copy of a document on the subject of vaccination, which, perhaps, you will feel interested in perusing, especially now that you are adopting inoculation amongst sheep with such great success.

The facts contained in this paper are beyond dispute, and if my ancestor had had them advocated at the same time that Dr. Jenner's case came before the public, he (Dr. Jenner) would probably not have received a grant from Parliament, nor would a statue have been erected to his memory. Be this, however, as it may, my ancestor was the *first* discoverer, as Jenner's dates are 1776 and 1777.

To Professor Simonds.

(Copy.)

Mr. Benjamin Jesty, farmer, of Downshay, in the Isle of Purbeck, having, agreeable to an invitation from the medical establishment of the original Vaccine Pock Institution, Broad Street, Golden Square, visited London in August, 1805, to communicate certain facts relating to the cowpock inoculation, we think it a matter of justice to himself and beneficial to the public to attest that, among other facts, he has afforded decisive evidence of his having vaccinated his wife and two sons, Robert and Benjamin, in the 1774, who were

thereby rendered unsusceptible of the smallpox, as appears from the exposure of all the parties to that disease frequently during the course of thirty-one years, and from the inoculation of the two sons for the smallpox fifteen years ago.

That he was led to undertake this novel practice in 1774 to counteract the smallpox, at that time prevalent where he then resided, from knowing the common opinion of the country ever since he was a boy—now about sixty years ago —that persons who had gone through the cowpox naturally, *i. e.*, by taking it from cows, were unsusceptible of the smallpox; by himself being incapable of taking the smallpox, by having gone through the cowpox many years before; from having personally known many individuals who, after the cowpock, could not have the smallpock excited; from believing that the cowpock was an affection free from danger; and from his opinion that by the cowpock inoculation he should avoid engrafting various diseases of the human constitution, such as the evil, madness, lues, and many bad humours, as he calls them.

The remarkable vigorous health of Mr. Jesty, his wife and two sons, now thirty-one years subsequent to the cowpock, and his own healthy appearance at this time—seventy years of age—afford a singular proof of the harmlessness of that affection. But the public must, with particular interest, hear that during their late visit to town Mr. Robert Jesty very willingly submitted publicly to inoculation for the smallpock in the most rigorous manner, and that Mr. Jesty was also subjected to the trial of inoculation for the cowpock after the most efficacious mode, without either of them being infected.

The circumstances in which Mr. Jesty purposely instituted the vaccine pock inoculation in his own family, viz., *without any precedent*, but merely from reasoning upon the nature of the affection among cows, and from knowing its effects in the casual way among men—his exemption from the prevailing popular prejudices, and his disregard of the clamorous reproaches of his neighbours—in our opinion well entitle him to the respect of the public for his superior strength of mind; but, further, his conduct in again furnishing such decisive proofs of the permanent antivariolous efficacy of the cowpock in the present discontented state of many families, by submitting to inoculation, justly claims, at least, the gratitude of the country.

As a testimony of our personal regard, and to commemorate so extraordinary a fact as that of preventing the smallpox by inoculation for the cowpox thirty one years ago, at our request a three-quarters length picture of Mr. Jesty is

painted by that excellent artist, Mr. Sharp, to be preserved at the original Vaccine Pock Institution.

George Pearson,
L. Niehll,
Thomas Nelson, } Physicians.

— Wheate,
F. Foster, } Consulting Surgeons.

Joseph Constantine Carpen,
J. Doralt, } Surgeons.

Fra. Rivers,
Everard A. Brande,
Philip de Bruyn, } Visiting Apothecaries.

J. Heaviside,
T. Payne, } Treasurers.

Facts and Observations.

LICENSES FOR LONDON COW-HOUSES.

At the present time courts of Petty Session are holden in various parts of London for the purpose of licensing cow-houses. The Sanitary Committee of the Vestry of St. George, Hanover-square, laid before the magistrates the following conditions, on which alone such licenses should be granted; these were signed by every applicant. Considering that the number of the cows is now under control, and the removal of refuse likewise, there ought to be no further complaints, if the officers of the vestries do their duty.

"1st.—With regard to new applications for buildings not heretofore used for the purpose, they recommend the justices (by whom the license is granted)—That no shed containing two rows of cows shall be less than 25 ft. in width. That no cow-shed shall have any dwellings or workshops over it, but that it shall be open to the roof, which shall be covered with tiles, loosely set. That the stalls for two cows shall not be less than 7 ft. 4 in. in width, and 8 ft. in depth; that each shall have a raised platform, with a gutter or channel properly sloped, on each side and behind. That the shed shall be

drained by pipe drains, with inlets not more that 15 ft. apart in the principal gutter, and properly trapped. That the mangers shall be of stone, and capable of being flushed out. That sufficient light be provided. That ventilation be provided by louvre openings in the roof and other means, to the satisfaction of the vestry. That the water supply be abundant. That the pavement of the cow-sheds and yards be of stone or hard brick, with proper slopes, and be kept in good repair. 2nd.—With regard to all cow-sheds, they recommend that the following undertaking be agreed to by each applicant:—That the said sheds and yards shall be properly limewashed at least four times a year, within fourteen days of the four usual quarter days. That the grains shall be kept in pits, with the bottom paved with flagstones, and drained. That the dung shall be kept in an open yard, in a receptacle not sunken, but with a bottom raised above the surface of the ground, and enclosed by a dwarf wall, from 2 to 2½ ft. high; the bottom to be paved with flags, with a fall to one end, where there shall be a trapped drain. That where there is no space in the yard, the dung may be kept in a similar receptacle within the shed; but that in either case a cover shall be provided if required by the vestry. That the dung shall be removed daily before 9 a.m.; that it shall be removed entirely, and the receptacle be washed out with water, to which the carbolic acid, or some other disinfectant, shall be added if required by the vestry. That the yards and sheds shall be similarly washed twice every day, at the least. That no greengrocer, fishmonger, poulterer, or other tradesmen, be allowed to bring offal or rubbish, and deposit it in the receptacles for dung attached to any cow-shed. That the number of cows in any given shed shall not exceed that which is fixed by the officers of the vestry, subject to the decision of a magistrate." *Medical Times.*

DIPHTHERIA IN PIGS.

Several statements having appeared in the public papers to the effect that this disease had attacked the pigs in an *epizootic* form in Wiltshire, we have made inquiry into the subject, and learn from Mr. Scott, M.R.C.V.S., Chippenham, that the malady has been entirely confined to the farm where it originally broke out among a lot of fifty. Mr. Scott having kindly forwarded one of the animals to the College, it was examined *post-mortem* by Professor Varnell,

who confirms the opinion as to the nature of the disease. No special cause for the outbreak was manifest to Mr. Scott, who writes, "the pigs had been fed on the usual diet—whey and corn." A change of location was determined upon, which has had the effect of totally arresting the further progress of the malady.

COMPARATIVE FATTENING OF SHEEP.

From the experiments of Mr. J. B. Lawes on the fattening of sheep, we learn the following comparative facts as to the capabilities of the different breeds:—While sheep of the Sussex breed consumed of the following food to make 100 lbs. of live weight, namely, 297¼ lbs. of oilcake, 285½ lbs. of clover, and 3835¾ lbs. of swedes; the Hampshires consumed 291½ lbs. of oilcake, 261¼ lbs. of clover, and 3966¾ lbs. of swedes; cross-bred wethers, 264½ lbs. of oilcake, 251¾ lbs. of clover, and 3725¼ lbs. of swedes; cross-bred ewes, 263½ lbs. of oilcake, 250¼ lbs. of clover, and 3671 lbs. of swedes; Leicesters, 263¾ lbs. of oilcake, 251¼ lbs. of clover, and 3761 lbs. of swedes; and Cotswolds, 253½ lbs. of oilcake, 216¾ lbs. of clover, and 3557½ lbs. of swedes.

COMPOSITION OF MILK.

According to Hadlein, milk contains in every 100 parts—phosphate of lime, 2·31; phosphate of magnesia, 0·42; phosphate of peroxide of iron, 0·97; chloride of potassium, 1·44; chloride of sodium, 0·24; and of pure soda, 0·42. Such is the analysis of the inorganic constituents of milk. One thousand parts of milk, in its ordinary condition, were found by Professor Johnston to contain—butter, 27 to 35 parts; casein, 45 to 90 parts; milk-sugar, 36 to 50 parts; chloride of potassium, with a little chloride of sodium, 1¼ part; phosphates, chiefly lime, 2¼ parts; other salts, 6 parts; and of water, from 822¼ to 815 parts.

THE VETERINARIAN, NOVEMBER 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

OPENING OF THE SESSION AT THE ROYAL VETERINARY COLLEGE.

The opening of the scholastic session of the Royal Veterinary College took place on Monday, October 6th, when the introductory address was delivered by Professor Simonds. It is scarcely consistent with our position that we should comment upon the sentiments expressed by the author, but rather leave the consideration of them to our readers, who, as the address is given *in extenso* in our present number, will be enabled to judge for themselves. One hope we may, nevertheless, be allowed to express, namely, that the good advice and encouragement given to the pupils will be duly appreciated, and that many at the close of their studies will have proved to be examples in all things to those who are to follow them, while they themselves shall reap the reward of their honorable comportment and diligent attention.

The attendance of the members of the profession, and personal friends from a distance, was never greater; so much so, indeed, that not only the theatre itself, but the approaches thereto, were filled to repletion. It is evident that the size of the lecture-room is too much restricted for such gatherings, as, indeed, it has also proved of late years to be for the ordinary requirements of the class. This difficulty we believe to be in the way of removal, and with it, no doubt, will be associated other improvements in the scholastic department of the College.

We pass, however, from this subject to another, and would ask, ought not these "*annual events*" to be made profitable beyond the mere inaugurating of a sessional course of lectures? It is evident that the members of the profession, as a whole, eagerly avail themselves of the occasion to travel to town from the most remote parts of the country, stimulated, no doubt, both by the desire to encourage the students by

their presence and to renew old friendships. Few things are found, as a rule, to possess interest enough to secure an annual assemblage of a scattered profession, and many a desired object is therefore blighted in the bud. Here, however, this essential to success already exists, and we think it ought to be turned to a profitable account. Many among us can look back with pleasure on social meetings and convivial *reunions*. These are suited to the tastes and habits of Englishmen, and, rightly used, we should be found among the advocates for such gatherings. But they need neither begin nor end in mere physical enjoyment. A mental feast might profitably be added, and a revival take place of meetings which marked the early days of the improvement of veterinary science. Let this matter receive the attention of those for whom we write. Let it come incidentally before the Council at one of its early meetings, and we venture to assert that none will repent the lending a hand to bring us back to the intellectual feasts of the days of yore.

THE VACCINATION OF SHEEP AS A PREVENTIVE OF SMALLPOX.

After a slumber of fourteen years the vaccination of sheep, as a preventive of smallpox, appears to have risen like a phœnix from its ashes. We have nothing to say against the resuscitation of this question by its advocates, but, on the contrary, we hail its reappearance with much satisfaction. Whether fresh investigations will substantiate or not the conclusions arrived at in by-gone days, experience alone can decide. We gave good heed to the subject then, and feel it no less incumbent upon us to do so now. Indeed, if it be possible, even more consideration will be given it, so as to guard against erroneous conclusions. Nevertheless, we feel bound to say that our opinion of the inutility of the practice is in no way altered by the statements which have gone forth. We have answers for all these—convincing replies—had the time come for their being given. Many who have written on the subject know, in truth, nothing, either scientifically or practically, about it. These are easily disposed of. Others, who should be able

to give reliable information, have suppressed facts, as if the memories of those who tested their experiments had entirely failed them, and documentary evidence had no existence. Notwithstanding this, we have resolved to bear reproach for a time rather than expose the doings of some. It would, however, have been far otherwise had the smallpox of sheep been extending, as then our duty would have been to speak out boldly and without reserve. One caution alone we now give, and that is, to warn farmers against building their hopes of preventing the disease on a wrong foundation. Experiments of the vaccination of sheep are worth but little unless tested by the counter-proof of inoculation.

Under these circumstances our readers will learn, with much satisfaction, that the whole subject is to be thoroughly investigated by order of the Government. No less than 200 sheep have been purchased for the purpose, and the experiments have already been begun. Mr. Marson, Resident-Surgeon of the Smallpox Hospital, and Professor Simonds, are commissioned to conduct the experiments, many of which will be dictated by the Medical Officer of the Privy Council, and be under his immediate supervision. Thus the question bids fair to be set at rest for ever, and England to be placed in a position to tell the world how much preventive value against *variola ovina* belongs to the vaccination of sheep.

Among other things it is proposed to procure lymph direct from the cow for use on the sheep, and in this many of our friends, especially those residing in dairy districts, can render the commission important assistance. We ask, as a favour, that veterinary surgeons will be on the look-out for natural cases of cow-pox, and that they will procure a supply of lymph from every *pure* case of the disease they may meet with, for the use of the commission. Lymph is best taken in capillary glass tubes, but these not being at hand, it may be secured on ivory points; and if so, these should be charged two or three times in succession. The chief care, however, will be needed in selecting the case, for, as our readers are aware, the genuine pock is rare among cows, but ordinary eruptions on the teats very common.

APPOINTMENT OF MR. VARNELL AS PROFESSOR OF ANATOMY AND CLINIC.

Our readers will learn with a satisfaction equal to our own that the Governors of the Royal Veterinary College, at their last meeting, held a few days since, conferred the title of Professor of Anatomy and Clinic on Mr. Varnell. For a considerable time the duties of these offices have been most efficiently performed by Mr. Varnell, while his official standing was only that of Assistant-Professor. We regard this act as a very gracious one on the part of the Governors, and a well-merited honour to the recipient.

VETERINARY MEDICAL ASSOCIATION.

We beg to remind the members of the Veterinary Medical Association that the weekly meetings have been resumed, and that they will be held in the theatre of the Royal Veterinary College every Tuesday evening, at half past six. Veterinary surgeons residing in London and its vicinity are earnestly requested to take part in the discussions, that the Association may hold, as it was wont, its true position among the scientific societies of the metropolis.

VETERINARY PROTECTION SOCIETY.

It being proposed to establish a "*Veterinary Protection Society,*" for the purpose of defending its members against legal proceedings for any supposed want of professional skill in the treatment of animals committed to their care, or any presumed neglect on the part of their agents or servants, the *Provisional Committee* have to request that those members of the profession who may be desirous of joining the Society will intimate the same in writing to the Hon. Secretary *pro tem.*

The Committee will meet in a few days for the purpose of receiving the names of members, and of considering the best means of carrying out the objects of the Society.

W. H. Coates,
Hon. Sec.

10, Red Lion Square, Holborn.

Extracts from British and Foreign Journals.

THE OUTBREAK OF SMALLPOX AMONG SHEEP IN WILTSHIRE.

The circumstances attending the recent outbreak of smallpox among sheep in Wiltshire are of unusual interest. The facts, so far as at present known, are as follows:

In July last a fatal form of sickness broke out in the flocks of Mr. Joseph Parry, of Allington, near Devizes. At first scattered instances of the malady occurred in a flock containing about 300 two-year-old ewes. In a few days, the sickness increasing, the lambs of this flock, which had up to this time been folded with their dams, were separated, put with others, and turned amongst the general breeding flock, making altogether above 1000 ewes and 700 lambs. In the course of a fortnight the sickness showed itself also among this flock, affecting the lambs as well as the ewes. It is not quite certain from the accounts whether the time of outbreak in the general breeding flock is calculated from the first occurrence of sickness among the two-year-old ewes, or from the time of mixing the lambs of that flock with the larger flock. Presently the sickness increased to so great an extent that "for days in succession as many as twenty and thirty of the ewes died in the most loathsome state of disease, their bodies covered with pustules, and a viscous matter running from the nose and from the eyes, rendering the sheep completely blind, and emitting the most foul stench."*

Alarmed with the rapid spread and malignancy of the disease, seeing that whatever he could do to check or alleviate it was of no avail, ignorant of its nature, and, according to the authority just cited, "finding that no one in the neighbourhood could give any satisfactory explanation as to the nature of the malady," Mr. Parry sought the aid of Professor Simonds, of the Royal Veterinary College. This gentleman, on the symptoms of the disease from which the sheep were suffering being detailed to him, at once concluded that the malady was *smallpox*, a conclusion fully confirmed on a subsequent inspection of the ailing flock. But when the professor sought to trace the origin of the outbreak he was foiled.

Hitherto it has been held of the smallpox of sheep as of the same disease in man, that it has never appeared (that is, within cognizable periods) except there was some traceable or probable source of communication by contagion; that, indeed,

* 'Devizes and Wiltshire Gazette,' quoted in the 'Veterinarian' for September.

the disease never arose spontaneously. In the present instance, however, the introduction of the malady into the affected flock seemed pretty nigh impossible, at least highly improbable. No additions had been made to the flock from without, and no rams hired for two years. The disease could not have been imported by the shearers, as all the flocks they had worked among this year were known, and were ascertained to be and to have been free from the slightest symptom of the disease. No communication with the sheep of any strange flock, moreover, appeared to have or could well have taken place. But, most conclusive of all, it was not known that smallpox had occurred at all among the flocks of this country for several years.

Smallpox (*variola ovina*) is a disease of very recent date among sheep in England. It first broke out in the vicinity of London, in the autumn of 1847. In 1848-49 and 1850 the affection spread among the flocks of many counties, and caused immense losses. The origin of the malady, in this instance, could clearly be traced to the importation of several infected sheep from the continent, where it has long prevailed, more or less, and is never, perhaps, entirely absent from the wide district from which sheep are brought for our markets. The disease first declared itself in a small flock of sheep which had been imported, and sold to different purchasers in Smithfield Market. From these sheep, and others imported about the same time, all doubtless coming from an infected district of the continent, and many of which were seized with smallpox within a fortnight after landing, the disease was derived, and spread to our own flocks. Notwithstanding, however, the formidable nature and wide extent of the epizootic which followed, since 1853 (according to the writer of the article on "Sheep" in Morton's 'Cyclopædia of Agriculture') the affection has disappeared. Hence the recent outbreak of smallpox in the flocks at Allington would appear to be involved in mystery; and from the asserted improbability of its importation from a foreign source, and the absence of all evidence whatever of the existence of the malady as a sporadic affection among our own flocks, it would seem as if the conclusion were almost forced upon us that the outbreak may have arisen spontaneously. "Hitherto," writes Professor Simonds,* "we have regarded smallpox as spreading only by contagion; now we must ask whether it can have a spontaneous origin? If the latter, no flock is safe, nor any part of the country secure. That which has occurred in Wiltshire may happen to-morrow in Sussex, and the next day in the midland counties. Having been consulted on the discovery

* 'Veterinarian,' September, 1862, p. 586.

of the disease by the owner of the animals, we have pretty well exhausted our stock of surmises for its introduction, without making much progress towards a satisfactory explanation of the circumstance. The part of Wiltshire where the malady made its appearance is peculiar for its isolated position. No foreign sheep travel its roads, nor have any been known to be purchased by the butchers of the neighbourhood. The flock, consisting of 992 ewes, 9 rams, and 710 lambs, in which the disease originally manifested itself, has had no fresh animals, male or female, introduced into it, nor has it been commingled in any way with other persons' sheep."

The possibility of a spontaneous origin of the disease would also seem to be indicated by a subsequent outbreak in a flock at some little distance from Mr. Parry's farm. Up to August the 18th the disease had been entirely confined to Mr. Parry's flocks, but on that day a flock of 400 fat wethers belonging to a Mr. Harding, of Etchilhampton, showed signs of infection. The spot where the sheep were folded was about a mile and a half distant from Mr. Parry's farm, and in the intermediate space were other farms occupied by flocks belonging to different proprietors, and every care had been taken to prevent either direct or mediate communication with Mr. Parry's flocks; as an additional precaution, the sheep had been driven to the part of Mr. Harding's farm most distant from Mr. Parry's. The flocks on the intermediate farms still, we believe, remain unaffected.

Since the irruption of the malady among Mr. Harding's sheep the disease has appeared in other flocks in the same district, and also in Berkshire. But in the later instances of the outbreak there is too good reason to believe that the disease was communicated to the healthier flocks by lambs or sheep purchased from flocks which were infected, but which up to the time of sale had not shown any indications of the disease.

Obscure as the first origin of this outbreak may at present appear, a little consideration will, however, show that the probability of the disease having been communicated is by no means exhausted. The fact of the nature of the malady ravaging Mr. Parry's flocks not being recognised until Professor Simonds had been consulted, throws the gravest doubts on the assumption of the disappearance of smallpox among our flocks since 1853, or, at least, in more recent years. The first introduction and ravages of smallpox among the flocks of this kingdom must have fallen under the immediate observation of very many of our present sheep-farmers; the disease, moreover, is one of the most glaring character, and

by no means difficult of diagnosis, even by the uninitiated. Hence it is far from improbable that sporadic smallpox may have occurred from time to time among our flocks, although not coming under the notice of a qualified veterinary practitioner.

Again, the possibility of infection from a foreign source is not entirely shut out, notwithstanding that since the outbreak of 1847-50 an inspection of all foreign sheep landed in England has been enforced. Although no instance of the disease has been reported from any of our ports, it is not to be forgotten that there are no means of ascertaining from what districts of the continent the sheep originally come, that is to say, whether from infected or healthy districts. Further, only such sheep are stopped as exhibit manifest tokens of ill-health. But, as in the first outbreak, the earliest indications of sickness may not be shown until a fortnight or three weeks after landing. Therefore the practicability of the disease having been casually introduced in this fashion is not to be set aside without special inquiry.

It may be urged, however, that in either case the difficulty of tracing the outbreak in Mr. Parry's flock to communication would not be in the least lessened from the peculiar circumstances and isolated conditions of the flocks. But a very serious doubt has been cast upon the completeness of this isolation by Principal Gamgee, of the New Veterinary College, Edinburgh. He avers,* from personal inquiry, that there is a free communication between different parts of the adjoining country and the Downs of Wiltshire. "There is," he states, "a drift along the celebrated Wansdyke which has been repeatedly the cause of the spread of contagious diseases from affected cattle and sheep traversing the Downs in order to avoid the payment of tolls on the high road. The public may rest assured (he adds) that there is no ground at all for the belief that smallpox could break out in Wiltshire spontaneously."

Apart from the doubts suggested by the details themselves and Mr. Gamgee's statements, there are others, arising out of the known or presumed phenomena of contagious diseases, which cannot be altogether ignored. The doctrines of the extreme school of contagionists (if we may so term the holders of these opinions) have been so admirably summed up in the columns of a contemporary,† in reference to this outbreak of smallpox, that we cannot do better than cite them as there expressed. Writing of the theory of spontaneous origin of the outbreak, it is said—

* 'Times,' September 10th.

† 'Social Science Review,' August 16th, 1862.

"Is that possible or feasible? In the presence of all the known facts respecting contagious diseases, we must express our entire disbelief in the theory of spontaneity. The same law extends to contagious diseases as is afforded in the propagation of animal life, *i.e.* there can be no new presence without an antecedent, or, in plainer words, something cannot arise out of nothing. The first of these sheep attacked, at some particular moment, was a healthy animal; it became diseased, and as a result of that disease yielded products poisonous in character, which produced the same changes and the same products in other sheep: *ergo*, the first sheep must either have been subjected to a similar poison, or the others did not suffer from the contagion of the first. To admit any difference in this argument is to assume that two causes can produce one phenomenon, which is absurd. The spontaneous origin of the disease is, therefore, the last hypothesis that can be accepted; before it there are two others, either of which, however improbable, have at least the merit of not being impossible. The first of these is to the effect that the germ of the disorder was conveyed to the animal first affected, a germ derived from some other animal previously affected. How the germ was carried it would be speculative to suggest, but the possibilities of conveyance are within the range of experience. These poisons, indestructible at common temperatures, and solid in their form, have a susceptibility of adherence to other solid bodies, and may be intentionally or accidentally carried, retaining their poisonous properties for any number of years, over the whole universe; consequently, although the probabilities were as a million to one against such conveyance, the possibilities remain."

The writer then proceeds ingeniously to suggest the possible relationship of the disease which had broken out among Mr. Parry's sheep to farcy. We presume, however, that now any doubt as to the actual nature of the affection, and as to its being *variola ovina*, is fully set at rest.

A logical deduction holds good only so far as the premises upon which it is based are sound. Now, the assumption that the propagation of animal life and of contagious diseases is governed by the same law, is open to serious question. The analogy is, no doubt, most plausible; but this is not sufficient to justify the assumption. Recent experiments have again conclusively shown (a doubt having once more arisen on the subject) that animal life is never known to be generated without a presumption, amounting almost to absolute demonstration, of a pre-existing germ. But we are not aware that any like proof, or equivalent probability, has been shown of the pre-existence of germs of at least two diseases, one of which, under certain conditions, is highly infectious, and the other is both contagious and infectious in the utmost degree—we allude to typhus and puerperal fever. These instances alone serve to vitiate the analogy and its logical consequences. Probability, not possibility, is the rule of analogical argument in physical science; and the possibility of the laws of one series of phenomena being similar to the laws of another and very different series (so far as at present known) cannot be admitted without the extremest caution,

and then only as a guide to research, not a limitation. At every step we are taught caution in the use of analogical argument in pathology. The purulent ophthalmia of infants may unquestionably be occasioned in parturition, and there is no doubt that, once developed in a single individual, it may be widely propagated to others by the direct application of the purulent discharge, and probably also by diffusion of particles of this discharge through the atmosphere. It can scarcely be admitted that the causes of the first and subsequent cases are identical. The same is true of acquired and propagated purulent ophthalmia in man and of certain forms of gonorrheal discharge.

It is undoubtedly correct that we do not know the limit of retention of deleterious properties by contagious or infectious matters. In smallpox and scarlet fever, for example, particularly the latter, we know that the poisonous emanations from the sick maintain their active properties for long periods. But we must not confound the question of limitation with that of indestructibility. It is to be remembered that the contagious virus diffused from the sick has never yet been separated from an infected atmosphere, and subjected to scientific analysis. Much may be inferred from its effects; but much also lies hid. If we permit ourselves, then, to adventure conclusions other than those which are warranted by the facts actually within our grasp, we run the risk of endless confusion.

The occasionally observed prolonged retention of virulent properties by the poisonous emanations or secretions of certain specific diseases must, in seeking the conditions determining any given outbreak of such diseases, not be lost sight of, and must, among other considerations, influence our inquiries. For example, the poisonous emanations or secretions from epizootic pleuro-pneumonia or eczema will long infect stables, cattle-sheds, trucks, and even plots of ground But it is manifest that to extend the conclusions from this fact beyond what is actually warranted by observation can aid us little. For where we must, in the absence of all other evidence, fall back upon the doctrine of the "indestructibility" of specific poison-germs for the explanation of any given outbreak, it is tolerably certain that the immediate conditions of the outbreak are so much more important than the theoretical that we may well afford to let the latter rest in abeyance. The doctrine of "spontaneity" may never, perhaps, extend beyond this point, that, under certain conditions, all evidence of specific origin to a disease is lacking; but if the doctrine be made to imply more than this, like that of "indestructibility," it carries us into a region of

speculation, where ingenuity must supply the place of more sober research.

When, moreover, a contagious element is manifestly present, we err egregiously if to this we attribute the sole part in the propagation of disease. No word, in the whole range of medical science—human or veterinary—has done, or still does, more mischief than the word "contagion." Given *contagion*, and it is too commonly supposed, both professionally and popularly, that in this single fact we have all that is required to account for the propagation of a communicable disease. It cannot be too strongly insisted upon that contagion is not an absolute but a relative fact; that the contagious element is inoperative except under certain conditions. Remove the conditions, and the poison-germ is powerless. No specific communicable affection is exempted from this law, not even smallpox or scarlet fever, although these diseases are least manifestly subjected to it. It is not sufficient, therefore, to determine, in investigating the extension of a communicable disease, that it possesses contagious or infectious properties, but also to determine under what conditions those properties come into play. Now, it is in researches conducted to this latter end that all the great discoveries and improvements in the control and prevention of epidemics have taken place, and which still promise the richest results to the investigator. Until a very recent period it has been customary to lay the greatest stress upon, and to devote the most attention to, the exclusion of the poison-germ. Even now, largely in medical and more especially in veterinary science, the chief aim is concentrated upon measures to prevent the introduction of the contagious element. There can be no doubt that if this could be effected, the greatest conceivable protection from a disease would be obtained. But the practicability and efficiency of such a course must be learned from experience. What, then, does experience teach us on this subject? It teaches us that the strictest quarantine and the most perfect sanitary cordon have not prevented either the introduction, or spread, or development, of any one of the great epidemic or contagious diseases in a state or country; that whenever, over large districts or in isolated localities, the attention has been centred solely upon the prevention of the introduction of contagious disease from without, that prevention has, as a rule, failed; that the most virulently contagious diseases have broken out within the limits of and in spite of the most stringent protective observation, while contiguous districts and populations, entirely unprotected, have either escaped or suffered but very slightly. On the other hand, experience has also taught us that the

introduction of a contagious disease into a given locality, under certain conditions, has led to a formidable extension of the disease; that the introduction of a like disease in another locality, under different circumstances, or into the previous locality at a different period, has been followed by no evil consequences, the disease dying out in the individuals primarily affected; and that the most efficient means of protection from a contagious affection, even when pestilential, has been the removal of the conditions fostering the development of the disease, not the attempted exclusion of the disease itself.

The conclusion is obvious, that any system which may be adopted for the prevention of the extension of a contagious disease will, in all probability, entirely fail, unless it provides, not only for the exclusion of the disease, but also for the removal of the whole of the conditions upon which the further development of the malady depends.

That the latter is by far the most important point to attend to, a little reflection will show, even if the vast experience of many people and many epidemics and epizootics does not alone suffice to convince. Consider for a moment the mode of manifestation of all great epidemics. A few scattered cases of the disease at an interval of, perhaps, several months—a few isolated instances of small but significant outbreaks—these are the usual forerunners of the great outbreak, and are commonly neither heeded nor even known. But to make a provision for the exclusion of the possibility of contagion during this period would be permanently to interpose so serious an impediment to commerce and intercourse, as to make both the one and the other well nigh impracticable; and this for an end the attainment of which is extremely doubtful, if not altogether improbable. Let this consideration be applied to efforts intended to prevent the introduction of disease from without into the boundaries of a kingdom. And now of contagious disease within the limits. When diphtheria first attracted notice in this country, during the recent epidemic, the then known times and places of appearance of the disease gave rise to the belief that it had first broken out in the south-eastern counties, and from them gradually spread by contagion over the remainder of the kingdom. The outbreak was, moreover, thought to be connected with a formidable irruption of the disease which had previously occurred in Boulogne. It was a noteworthy fact, that one of the earliest cases recorded on the south-eastern coast was in a household which had but recently crossed the channel from the infected French city. Here, then, the fact of diffusion by contagion seemed most probable, if not clear. It is now,

however, known that several scattered cases of diphtheria had occurred in various inland districts of England in 1848 and 1849; that in the winter of 1849-50 the disease prevailed to a most serious and fatal extent in Haverfordwest, in Pembrokeshire, and that at least three other local outbreaks at different intervals of time preceded the general outbreak.* Again, and touching more closely on our present subject, notwithstanding the stringent sanitary police exercised in France over domestic animals suffering from contagious diseases, this has neither prevented the extension at different periods, nor terminated the ravages, nor saved any of the great sheep districts of France from the ravages of smallpox. This disease has now prevailed as an epizootic, now as an enzootic; now it has infected the flocks of one district, now of another; now it has broken out in a comparatively mild, now in a malignant form, in spite of the best conceived and most ably governed sanitary police measures. Not until the disease has become painfully manifest, indeed, could a sanitary police be of any avail, and then chiefly in restraining somewhat the sale of plainly diseased animals, or of the animals from infected flocks, or of their flesh as food. Indeed, if it be difficult to exercise a strict and trustworthy restrictive observation over disease in man, how much more so will this be the case over numerous and vast flocks, governed, too commonly, by ignorant herdsmen?

Now, we would not have it thought that we conclude, therefore, that the restrictive efforts of a sanitary police in the prevention of epidemic or epizootic disease are of little utility. Far from it. It is of the greatest importance, for example, to prevent the sale or distribution from one district to another of diseased animals or diseased flesh; this is unquestionable. But the argument is, that this alone is not to be depended upon; it is, indeed, utterly untrustworthy for the prevention of the spread of disease, however contagious, and for the protection of a healthy district. The same remarks hold true, in a great degree, of the internal police of flocks and herds when affected by a contagious disease. While separation and isolation of the affected animals may be pursued with great success in restraining the propagation of the disease in small flocks, favorably situated for the experiment; in large flocks, so numerous as to render the daily inspection of the individual animals a matter of almost impossibility, or which are kept on lands which do not permit of satisfactory segregation and isolation, these measures have proved of little or no avail.

* See Mr. Radcliffe, "On the Recent Epidemic of Diphtheria." ('Lancet,' July 12th, 1862, p. 33.)

It follows, therefore, that while giving just attention to measures of sanitary restriction, our chief hope in the restraint of any contagious epidemic or epizootic must rest in ascertaining and controlling the conditions which are requisite for the development of its contagious properties. In several of the most fatal epidemics and epizootics, as, for example, in the typhus or typhoid of man, and the so-called "contagious typhus" and "pleuro-pneumonia" of beasts, we know that the conditions for their extension by contagion depend upon certain well-known deficiencies in the sanitary circumstances under which the individual is placed, and which being removed, the influence of contagion or infection, or both, is rendered nugatory. It does not follow that these deficiencies are at all times capable of being readily removed, as in the case of an old-built, imperfectly drained town, and ill-ventilated, badly sewered houses, fostering typhoid fever; or in the conditions of the vast herds of Western Europe or of Australia—the former liable to frightful murrains of contagious typhus, the latter recently decimated by epizootic pleuro-pneumonia. The proposition is that these conditions are much more certainly under our control than the contagious germs of diseases, as shown by experience. On the other hand, we know that the conditions of development of other contagious diseases, as smallpox and scarlatina, are less dependent upon local circumstances than upon the state of the individual at the time. What that state may be we are as yet entirely ignorant of in both cases named, and in the latter case we are unhappily compelled to depend for protection upon isolation of the disease alone; and how sadly inefficient this protection is, and almost necessarily so, we need not say. In the former case we should be in a like unfortunate position, were it not that science had discovered that the disease may be induced in a modified form, and the predisposition to it, that is, condition of development, thus exhausted.

What, then, should be the course of action to be adopted in the present outbreak in Wiltshire for the prevention, as far as practicable, or restraint, of the further spread of the disease, or obviation of its chief evils? Of the police measures prohibiting the sale of sheep within the infected districts, unless under the permission of a competent judge, the disinfection and purification of places occupied, temporarily or not, by affected animals, and also of the sale of diseased meat, as a safeguard to the public, there can be no question; and an Order in Council (somewhat late in the day, it must be confessed) has authorised the local authorities to take all needful steps in carrying out such measures. Of the means to be adopted for the more immediate treatment of the diseased

flocks little doubt can also be entertained, if what we have advanced be correct. There is, indeed, but one which offers absolute safety to the flock, or which gives a sure promise of mitigating the loss and anxiety of the farmer, to wit, inoculation. But the practice of inoculation is liable to be attended by evils of so grave a character that it is not to be adopted without serious consideration. It is not, indeed, to be wondered at that at the first outbreak a difference of opinion should have been manifested upon the propriety of its adoption by the chief authorities consulted on the question, Professors Simonds and Gamgee.

The question is one of immense moment both to the farmer and the public. It very seriously involves the substance of the farmer, and a staple article of food of the latter, as well as certain important manufactures. The value of the flocks in this country is estimated at no less than £100,000,000.* But the loss to the farmer is not to be estimated solely by the numerical diminution of his flocks from the mortality occasioned by the disease. In this loss must be estimated the losses occasioned by the death of sheep fat and fitted for the butcher, of sheep selected and set apart for the improvement of breed, the dropping of lambs, the loss of lambs deprived of their dams, from the difficulties experienced in rearing them, the deterioration in the flock which recover from the sickness and the impossibility of fattening them for a season, the loss of the wool, one of the most important losses, and, finally, the occasional destruction of the eyesight of the animal. Add the expenses occasioned by the most ordinary care and attendance required during an outbreak of the disease, and some conception may, perhaps, be formed of the loss a sheep-farmer may be subjected to whose flocks have the misfortune to be attacked with smallpox.

The mortality among sheep affected by epizootic smallpox ranges from 12 per cent. in the milder to 50 per cent. in the graver outbreaks among different flocks. Occasionally the mortality reaches even a higher rate, as much, indeed, as 60 or 70 per cent., as was observed in several flocks in this country in the outbreak of 1847-50. Generally an outbreak of epizootic smallpox involves a loss of at least one fifth of a flock. When the disease has become established among the flocks of a country, and is an annual visitant, or recurs at frequent intervals, the mortality may not exceed 7 per cent.

The mortality is affected both by atmospheric conditions and the state of the animal at the time of attack. It is found to be augmented either by great heat or by cold, by a low,

* 'Times,' letter from a correspondent.

wet or damp, and generally unhealthy location, by tender age, and by pregnancy. The animal being fatted, or in poor condition, or of a foreign breed, also exercises an unfavorable influence over the result.

It is most important to note, also, the usual mode of outbreak and progression of epizootic smallpox among a flock of sheep. The disease does not attack one or two members of a flock, and from these spread gradually through the whole flock, neither does it attack a whole flock at once. It shows itself, like most epidemic diseases in man, in two, or three, or more successive attacks, each involving a previously unaffected and greater portion of the flock, and each extending over from twenty-five to thirty days, until the entire flock has been affected. Hence it follows that the duration of an outbreak of smallpox in a large flock commonly extends over three or four months.

These facts being premised, let us briefly consider the measures to be adopted for preventing the spread or mitigating the ravages and losses arising from the disease.

Some of these require no comment. The prohibition of the vending, or exposing for sale, of sheep in a diseased state, is an initial step, as we have already remarked, admitting of no question. The same may be said of the destruction and careful burial of sheep hopelessly sick. These and all other measures imply the most thorough daily inspection of a flock practicable. There remains segregation of affected individuals, and isolation of infected flocks, and inoculation.

The circumstances under which separation alone, whether of individual sheep or of infected flocks, or of both, are likely to prove available, may, perhaps, be best gathered from the following extract from one of several articles by Professor Delafond, translations of which were published in the twenty-first volume of the *Veterinarian*. The articles are devoted to an examination of the question of inoculation of flocks of sheep for smallpox, as a measure of sanitary police. The opinions expressed by the learned professor, and the reasonings upon which they are based, deserve the highest consideration, and we would commend them to the attention of our readers for their scientific interest, in addition to their great practical importance at the present moment.

"So long," he says, "as the pox is confined to one flock, or in case even it should prevail among several flocks in the same commune or locality, isolation, whether it be in the pens or in the fields, is generally the only measure that can prevent the spreading of the malady. But when an epizootic and fatal pox is spread over a large surface of country, during a warm and dry season, and at a time that flocks are out grazing, and especially where natural obstacles, such as woods, hills, mountains, marshes, and broad streams of water, become no boundaries to the infected localities,

folding and sequestration being difficult of execution, incessant and often impracticable surveillance are the only measures, and they sometimes fail in arresting the progress of contagion. The persistence of sheep-pox in 1812, in the department of the Somme, together with its introduction into the Pas-de-Calais, and its propagation in fifty nine parishes (*communes*); the appearance of the malady in seventy-four parishes of the Marne, and its duration nine years in the district; its extension and continuance for two years, from 1820 to 1822, in the department of Aube and Herault, are, among other proofs which I could cite here, demonstrative examples that the sanitary measures prescribed according to the Acts of Parliament and regulations in force at the present day, particularly those of sequestration and folding, are insufficient in a great number of instances to arrest or confine the propagation of epizootic smallpox."

These opinions, amply supported by other continental writers, very fairly indicate the circumstances under which sequestration may be expected to be of avail; at the same time they show under what circumstances its failure may be anticipated. It may be presumed from the opinions of Mr. Gamgee, as recorded in the daily papers, that the infected flocks in the vicinity of Devizes are so situated as to render segregation and isolation practicable and, to some extent, successful measures. On the other hand, the general character of the outbreak and the malignancy of its first irruption in Mr. Parry's flocks give a high degree of probability to the assumption that the disease is epizootic in nature, and that this outbreak is but the forerunner of a more wide-spread manifestation of the disease. If this be the case, knowing the usual course of epizootic smallpox among a flock, the gravest doubts may be entertained of the sufficiency of separation and isolation to save the flock in every instance or to restrain the extension of the disease.

Separation and isolation failing, inoculation is our only resource. But before noting the value of this remedy, let us first see in what manner, and under what circumstances, English veterinary surgeons advocate its use. We quote here from that standard work, Stephens's 'Book of the Farm,' which, we believe, pretty accurately expresses the opinions most commonly held on this subject both at home and abroad:

"We decidedly object to the plan of inoculation simply as a means of precaution, whilst a flock is free from the disease, as by this means we propagate an infectious disorder, though in a mild form. The plan we advise, after some experience and considerable reflection, is, as soon as the disease appears in a flock, to practise separation and examination as rigidly as possible, but at the same time to inoculate one or two sheep. Then, if we find that the disease extends in spite of our daily examination, we shall have from these inoculated cases favorable lymph for the inoculation of the remainder. If some twelve or twenty cases of smallpox have really occurred, then, without any further delay, we advise inoculation to be practised on the

remainder of the flock; for it should be borne in mind that the earlier cases are generally mild, and the disease increases enormously in virulence and fatality as it extends. The advantages in favour of this plan appear to be these: we may select the most favorable weather for the operation, and in the course of six weeks are free from further anxiety about the matter; the utmost care can be taken of the flock during the period, and the greatest vigilance exercised to prevent the spread of disease to other flocks—care and vigilance which it may be difficult to adopt through so long a period as the system of continual turning might demand. Besides which, it should be remembered that there are at least three ewes to one wether sheep, and these ewes being kept for breeding, it is of the utmost importance to select the earliest and most favorable time for receiving the disease, and not to run the risk of their getting the disease naturally just previous to lambing. It is quite a mistake to suppose that the risk of spreading infection is increased by inoculation; in fact, it is lessened, for the disease becomes milder, having a mortality ranging from 2 to 10 per cent. It is also circumscribed, and necessarily entails the utmost vigilance, and prevents the sale of sheep from the flock for a given period—of twenty-one days."

The course here so clearly and, in our opinion, convincingly advocated, would appear to be substantially the same as that adopted by Professor Simonds in Wiltshire.

The advantages to be derived from the practice of inoculation under the circumstances recommended are so well set forth in the extract we have just quoted from the 'Book of the Farm,' that it seems almost superfluous to reiterate them. It may be as well, however, to examine a little more specifically the objections advanced against the practice. The objection most persistently urged at the present moment is, that by inoculation the disease would be largely multiplied, and the chances of its spread and naturalisation among our flocks increased. The answer to this is, that the measure is not to be had recourse to, neither is it advised, except when the disease has actually broken out among a flock, when separation and isolation have failed, and when there is a high probability of the malady running through the whole of the sheep. That, as a consequence, it substitutes a milder form of the disease for the natural disease, and limits the duration to a brief period of three or four weeks, obviating a probable duration of three or four months. In both ways, by the mitigation of the severity of the disease and the limitation of its prevalence, it diminishes the risk of spreading—a risk still further diminished by the more complete and thorough care which can be exercised over an entire inoculated flock than over a flock passing through the natural disease, and by the almost impossibility of an inoculated sheep being passed into the market or otherwise disposed of.

It is also urged that inoculation proves disadvantageous by giving the disease to animals which might otherwise escape,

by communicating, probably, as intractable and fatal a disorder as natural pox, and by consequently exercising as serious an influence as the natural disease on breeding, fattening, feeding, and the fleeces.

Inoculation is, at the best, a choice between two evils. But experience has shown that communicated smallpox, except under extraordinary and most rare instances of carelessness in inoculation, is more tractable in every way and much less fatal than the natural disease. The numerous statistics of inoculation practised under every circumstance of age, condition, and season, collected by Professor Delafond, and confirmed by his own wide observation, show a mortality not exceeding 0·5 per cent.—1 in every 200 successfully inoculated animals! Further, his statistics also show that in no instance recorded has inoculated smallpox given rise to a disease, even under the most unfavorable circumstances of operation and care, as fatal as natural epizootic smallpox. Again, the inoculated disease, from its mitigated form, gives rise to still other advantages. It limits the period when the fattening, breeding, and sale of the flock cannot be properly carried out, and diminishes the injurious effect upon the fleece.

In fact, inoculation substitutes a milder, more manageable, less fatal, and less injurious disease, for the more formidable disorder already present, limits the duration of the infection among a flock within the least practicable period, and diminishes the probability of extension of the malady.

The adoption of inoculation seems, therefore, to be a remedy admirably fitted to control an outbreak such as that which would appear to have occurred in Wiltshire, provided that the flocks operated on are so situated as to admit of satisfactory isolation. Under such a condition the remedy promises the greatest safeguard from loss, both to the farmer and the public. This is no question, we reiterate, of introducing a disease among hitherto healthy flocks, but of obviating, as far as practicable, the ill effects of a formidable affection already manifested among infected flocks, and when separation and isolation have been already tried and failed, or observed to be useless from the disease having become manifest in many sheep at the same time.

The results of inoculation on the continent have proved so favorable, and the practice is thought to have exercised so salutary an influence in obviating and controlling epizootic outbreaks of disease, that Professor Delafond has urged the importance of making its performance compulsory. Not the least of its benefits, it is asserted, have been the limitation

and diminution of anxiety and immediate expense as well as of ultimate loss to the farmer.

We are fortunate in possessing an able monograph on *variola ovina,* containing an account of the first introduction of the disease into England, by Professor Simonds,* and we would refer such of our readers as are desirous to become fully acquainted with its character and progress to this valuable book. We are glad to have to state also that Professor Simonds has been instructed by Government to investigate and report upon the origin and progress of the present outbreak of the malady. Principal Gamgee is also pursuing an inquiry on his own behalf in the infected district. We shall look forward, therefore, with considerable confidence to a solution of the doubts we have expressed at the commencement of this article, and a complete history of this extraordinary outbreak, from the researches of these accomplished veterinary scholars and practitioners.

POSTSCRIPT.

The preceding observations were already in the press when we received more accurate information of the condition of the infected flocks and probable sources of the outbreak in Wiltshire. It would appear that Mr. Parry's sheep-walk and neighbouring walks are traversed by so-called "drifts," or by-roads, frequently used by strange flocks and herds, to avoid certain tolls on the highway; that from the passage of strange flocks scab has been communicated to healthy flocks feeding on the sheep-walks traversed, and from the passage of infected herds vesicular murrain to herds feeding on the Downs; that the introduction of smallpox from a foreign source is, therefore, highly probable. Moreover, the manifestation of the disease hitherto among the flocks in the neighbourhood of Allington may be accounted for without the assumption of any unusual or epizootic sensitiveness of the sheep to the malady; and it is most probable that, had the earliest cases among Mr. Parry's flock been recognised, and the animals immediately killed, the extension of the disease would have been stayed. It would seem, also, to be highly probable that the further course of the disease among a flock, when it has once shown itself, may be at once stayed or held in thorough check by active and complete professional inspection, and the separation and destruction of

* 'A Practical Treatise on Variola Ovina, or Smallpox in Sheep.' Churchill, 1848.

the affected animals, without having recourse to inoculation. It further appears that inoculated flocks, through carelessness or inadvertency of the shepherds, have communicated the disease to other flocks, and that from the crowded state of the Downs due isolation of an inoculated flock is very difficult, and in certain cases, perhaps, impossible.

From these facts it would seem, then, that inspection and separation should be chiefly depended upon in the present outbreak, and inoculation only had recourse to as a final resort. It would also seem that if the outbreak should still extend, it would become a question for consideration whether or not inoculation should not be subjected to legislative interference —not for the purpose of prohibiting the measure, as some have advised, but of regulating its uses. For it would be requisite to forbid the performance of the operation by an unqualified person, and to compel, under heavy fines, the proprietors of inoculated flocks to entirely isolate their flocks. It is asserted that one or more flocks have been inoculated in the present outbreak in which no indications of smallpox have appeared. We shall be curious to learn what could have induced this course to have been taken.

If there is no legal right of way for strange flocks and herds along the "drifts" traversing the Downs, ought not the farmers to take some measures to prevent these by-paths being made use of by any but those who have a right of passage? Or, if a general right of way exists, should not steps be taken to prevent or diminish the probability of diseased sheep or cattle travelling along these roads, which are fully open to the grazing tracts?—*Medical Critic,* Oct.

[There is no ground whatever for the opinion that Mr. Parry's flock took the disease from any animals passing along the so-called "drifts," the fact being fully established that the sheep were on the most distant part of his farm, something like two miles, from these "by-paths," at the time they were first exposed to the infection, nor can it in any way be proved that "inoculated flocks, through carelessness or inadvertency of the shepherds, have communicated the disease to other flocks."]

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Clinique Vétérinaire, June, 1862.

ON THE NON-CONTAGIOUSNESS OF SPLENIC APOPLEXY IN SHEEP.

By M. Coute, Vétérinaire à Elue.

This paper is a reply to an article on splenic apoplexy in the *Recueil* of November, 1861, by M. Moisant. In the plains of Rousillon, says the author, splenic apoplexy (*sang de rate*) is enzoötic, and commits great ravages during the months of June, July, August, and September, and sometimes even in October and November, when heat and drought prevail. The numerous observations I have made, both on dead and living bodies, enable me to speak with some confidence. But if I were to describe the hygienic conditions in which our flocks are kept, the proximate and immediate causes which provoke the appearance of this terrible malady—in a word, all the considerations which bear on the subject—this paper would exceed the prescribed limits. I will, therefore, content myself by indicating the individual predisposition, the nature of the malady, its non-contagiousness, and then furnish the reader with a critical analysis of the article by M. Moisant. The pathological and cadaveric characters of this malady are known by every veterinary surgeon, and even by those who have only studied them by reading M. Delafond's excellent descriptions in his treatise on the maladies of sheep. I am convinced that the malady described by the learned Director of Alfort is identical with that between the districts which prevails in Rousillon, notwithstanding the distance and the difference of the localities where M. Delafond made his laborious and skilful investigations, a greater rapidity in the fatal termination of the malady in the cattle of Rousillon, with other small and unimportant details, being the only variation that has been observed. Individual predisposition, is so remarkable that it has been pointed out by every observer. It constantly happens that the strongest of the flock, those which are moderately fat, aged from one to four years, and those which have been put to fatten, are par-

ticularly subject to attacks of this enzoötic. Ewes in lamb and those which are suckling their lambs are less subject to it, and it is also very rarely attacks those which are under twelve months old; lambs are altogether free from it, which likewise holds good with individuals weakened by old age, poorness of living, or chronic diseases. The nature of splenic apoplexy is clearly revealed by cadaveric autopsy; the blood is found everywhere black and disorganized; this black, pitchy, putrid mass distends the spleen, and is accompanied by gelatinous infiltrations of a citrine colour, disseminated over the divers regions of the body. Finally, the short duration of the malady, and the speedy putrefaction of the dead bodies, all concur in establishing the essentially charbonous character of the malady. To those who have still a doubt I would observe that the blood retains its putrid, malignant character till after death. Thus it has happened that shepherds and butchers have been effected with malignant pustule after having skinned animals which had died of this disease. Many people have assured me of their having suffered from gastric derangements, and of the appearance of malignant pustules on different parts of their bodies, after having eaten of the meat of animals which had been slaughtered on being affected with this enzoötic. Splenic apoplexy is but one of the numerous types under which charbonous affections manifest themselves, and which have been with reason described as protean in form. In the present state of our knowledge this form would seem to be confined to three species of our domestic ruminants—the ox, the sheep, and the goat. Splenic apoplexy is not contagious. In support of the contrary opinion it must be observed that the malady breaks out simultaneously and successively in several individuals, but this is not a sufficient proof, as many other affections which prevail in sheep follow the same course without being contagious. A great number of facts and peculiarities, carefully observed during the evolutions of this enzoötic, contraindicate its contagious character. One need only call to mind what has been stated about individual predisposition to explain the preferences and exemptions which are regularly observed at every annual outbreak of the malady. If it were contagious, is it likely it would have certain categorical rules, to spare the old and debilitated animals as well as lambs? Amongst the latter it sometimes happens that they are sucking their mothers with impunity when these are already struck by a fatal attack of the enzoötic. This is not the case with those maladies which are really contagious; they strike all, indiscriminately; there is no sparing of some or exemptions of

others, which can be foretold with unerring certainty, as in the case of splenic apoplexy. Let us draw a comparison without going out of the nosology of the ovine species. Mange and variola ovina (*clavelée*) are incontestably contagious. Do they follow the same individual rules and exceptions of age or condition? Certainly not. The last so little, that of three epizoötics of the variola there were only 2 or 3 per cent. in many flocks which escaped the infection; moreover, I have seen some infected ewes drop their lambs with the skin covered with variolous pustules. If other proofs are wanted, I may state that I have often seen flocks of sheep attacked with splenic apoplexy where the mortality was not more than 3 or 4 per cent. Can it, then, be reasonably admitted that a malady is contagious when the losses are limited to so small a number? A fact even more conclusive is that all the communes in this district contain a certain number of sheepfolds (*bergeries*) which are all situated in the centre of the village. There are thus from eight to ten flocks of sheep which respire the same air in a somewhat limited space; moreover, they are apt to meet several times a day in the pasture, watering places, and on the roads. If the malady were transmissible by contact, opportunities would not be wanting; but that it is not so is proved that after the prevalence of the enzoötic some flocks have not lost one, and that others have only lost a small number, while, on the contrary, some have been decimated. My readers know how easily farmers are alarmed when their interest is assailed; if, therefore, they had the slightest suspicion that the malady were contagious, would they not at once apply to the cantonal authorities to have the law of sequestration put in force?

In his article in the *Recueil* M. Moisant, *vétérinaire à Châteaudun*, puts this question: Should the sanitary laws be enforced against splenic apoplexy? He asserts that in the month of August M. Roger, a farmer at Fresne, having lost a great number of sheep from splenic apoplexy, removed his flock to a farm in the commune of Droué (Loir-et-Cher), after having obtained permission of the proprietor, M. Joseph. In consequence of thus moving the flock, M. Roger was condemned by the Tribunal Correctionnel of Vendôme to pay a fine. After the flock of M. Roger had left, M. Joseph removed his own flock to a farm he had in Beauce. Some sheep died the first week after their arrival, in consequence of which M. Joseph was also summoned before the tribunal of police, and condemned to pay a fine. M. Moisant was requested to draw up a memoir on the subject, which was produced before the tribunal, and ran as follows:—"Splenic apoplexy (*sang de rate*)

is a contagious disease; this fact was established for the first time by the Veterinary Medical Association of Eure-et-Loir, in 1847." We agreed at that time to this opinion, having made researches and experiments jointly with Drs. Raibert and Authoine, with a view to elucidate this subject. Further on, M. Moisant asserts that the contagious character had, until 1847, escaped the notice of such men as Daubenton, Tessier, Yvart, Huzard, Gasparin, Hurtrel d'Arboval, and Delafond, who had studied the malady. In the face of these facts it is not quite so evident that the contagious nature of the malady had escaped the observations of these great men. How has the Medical Association of Eure-et-Loire, and all those who have again made experiments, established the certainty of contagion? By direct inoculation, and not otherwise. It is to be regretted that M. Moisant has neglected to mention under what condition this inoculation is to be performed, and the results which have been obtained. That by introducing the putrid matter of the *sang de rate* under the skin of a sheep in perfect health, the appearance of gangrenous or charbonous tumours might be produced, is not surprising to those who have ascertained the putrid character of the blood in animals affected by this malady; but that direct inoculation has the power of reproducing in all its integrity the symptoms and lesions appertaining to this malady require to be proved to demonstration. M. Moisant continues—"A doubt existed, which it was not easy to remove in those districts where the malady developes itself spontaneously. The object was to determine whether the contagion could be effected at a distance, either mediately or by volatile virus. The commission on splenic apoplexy of Eure-et-Loir named by the Minister of Agriculture and Commerce, presided over by M. Yvart, veterinary inspector, considered it one of their first duties to solve this doubt; to this effect they instituted a series of experiments, which were as follows:—In 1858, the *sang de rate* committed great ravages in Beauce. The commission selected a farm, where, in the memory of living man, the malady had never prevailed, the sheep-pens of which they divided into two halves by a double partition of open lattice-work, about one mètre in height, and one mètre thirty centimètres apart. In one compartment the flock of the farm, perfectly free from the malady, was confined; in the other were, successively introduced, sheep affected with splenic apoplexy. The commissioners found that only three of the former died, and that in one only the lesions of this malady were discovered, during the space of three months and seven days.

During also the time which the experiment was continued for the confirmation of its decision on this single case—the commission inoculated with the softer tissue of the spleen, introduced under the skin, three healthy sheep; but this experiment was negative, which has never been the case when the inoculation was made with the spleen of sheep which had undoubtedly died of splenic apoplexy. The commission, therefore, considered the fact as doubtful." This experiment evidently proves the absence of the contagious character of the malady by a volatile virus. This is, likewise, the opinion of M. Moisant, who concludes as follows:—"At the present time, direct experiments have failed to establish the contagious character by the volatile virus." He then quotes several remarks in support of this opinion, but he has lost sight of one important point, and has not informed us whether this sheepfold, which had been saturated with the infection in 1858, had received healthy sheep since that time, and whether they had contracted the disease M. Moisant declares strongly against the conclusions of MM. Roger and Joseph; but whose fault is it that they were so condemned? In 1847 a local committee made some experiments, and believed that it had made an important discovery, and in eager haste, on its own authority, gave to the *sang de rate* a contagious character. The magistrates, duly informed, inscribed the malady amongst the number of those which came under the sanitary laws, and hence the conviction by the correctional tribunal of the delinquents. If M. Moisant and his colleagues of the association had acted with less precipitation, and if, by means of the press, they had given an opportunity to those practitioners who had observed the malady to publish the results of their experience, there is no doubt but the question would soon have been decided, and we have every reason to suppose that the authorities would have seen nothing wrong in the displacement of the flocks of MM. Roger and Joseph.

P.S.—On the 25th December I addressed this letter to M. Leblanc. Since that time the *Clinic* has published the articles of MM. Moisant, Garreau, and Darreau. There exists at the bottom of this question a misunderstanding, which can only be removed by practically investigating the subject *de novo*. If the doctrine of contagion has obtained some partisans, it is because the results of the experimental inoculations were misinterpreted, and, on the other hand, the phenomena of the malady were not sufficiently considered. If the introduction under the skin of a portion of

putrefied spleen does in some cases, but not always, determine an attack of the malady in healthy sheep, this is not a sufficient reason to conclude that it is contagious. The results obtained under these circumstances are to be compared to those which would be produced by the inoculation of any other putrid or gangrenous matter. The inoculation, therefore, can only have a relative value. It is more essential to study the morbid characters of the *sang de rate*. Of such cases as manifest themselves without provocation, and which follow the immutable laws of nature, M. Garreau has given an account in the *Recueil* of February, 1862, and of experiments made at Nogent-le-Routrou, the results of which have their proper value, but it is to be regretted that the autopsies could not always be made sooner after death. As to the inoculations, it is surprising that there were a great number of the animals which resisted the truly septic poison. For those who have studied the malady on the spot there are two orders of facts, the importance of which have escaped the partisans of contagion, viz.—First, the rarity of the malady in sucking lambs. All observers have verified that the malady affects, principally, animals from one to three years old, and that it is rare in those lambs which receive mixed nutriment (milk and fodder); and, finally, that it is almost unknown to those who live exclusively on the milk of their mothers. Tender age, delicate constitution, cohabitation, incessant contact, exclusive nutrition by the milk of the mother, perhaps already affected with the malady, all these unfavorable conditions unite to threaten the lambs with this plague, and yet they escape. What can be concluded from this salient peculiarity, except that there exists no more fixed virus than miasmatic infection? Second, the beneficial effects of emigration. Every one agrees that, in the great majority of cases, the epizoötic is stopped by emigration, as if by enchantment. How can this fact be explained, and what is the conclusion to be drawn from it? In the same manner as those charbonous affections, of which the *sang de rate* is only a variety, it breaks out every year, at about the same time, with more or less virulence, in certain defined districts; the determining causes which give rise to it being specific, and altogether inherent to the localities. By the emigration of the flock the malady spontaneously ceases, provided, however, that the same causes do not exist in the new residence. It is precisely this spontaneous cessation of all the symptoms which authorises me in denying the contagiousness of splenic apoplexy.

SMALLPOX IN SHEEP.

Smallpox in sheep is an inflammatory-eruptive disease of the skin. It is epizoötic, enzoötic, and peculiar to sheep, to which they are subject but once in their life. The first mention of this disease is in the beginning of the sixteenth century, but probably it had existed long before. Since the beginning of the sixteenth century, when it is first mentioned by MM. Joubert and Rabelais, the affection has reappeared from time to time in different countries, and committed great ravages amongst the sheep. It has now spread over the whole of Europe, and even become enzoötic in some places. In England it was unknown until a few years ago, 1847, when it appeared in Middlesex. In most of the departments of France it makes its appearance epizoötically about every ten to fifteen years, but it occurs more frequently in the neighbourhood of Paris, where the commerce in sheep is more active. The disease shows itself externally by a phlegmon of the skin peculiar to the sheep; this is followed by an eruption, more or less general, of pimples, which secrete a peculiar fluid, then desiccate and fall off. These pimples are of a roundish form, more or less prominent, and various in size and number; they appear generally on those parts of the skin which are unprovided with wool, viz., between the legs, and round the eyes, on the nose and the lips, under the tail, genital organs, and the udder, but eventually invade the whole of the skin. This disease occurs at all times and seasons, but is greatest during the heat of summer and the damp cold of autumn and winter. It attacks indiscriminately the weak and the strong, always, however, beginning with the youngest of the flock. It is eminently contagious. It does not affect the same individual more than once; its effects are sometimes very disastrous; a great many of those affected by it die. Nothing is found among writers on this subject as to the cause of this malady, and we do not find that what is known of it at the present time has thrown any new light on it. It appears, however, that the first effects are on the mucous membranes of the gastric and respiratory organs, and that it is constantly by the irritation of the surfaces of these membranes that the malady commences, and that the irritation extends to the skin by decreasing and displacing that of the mucous membrane. It was at first thought that flocks which pastured in low, marshy land were more subject to it; but it has since been ascertained that those on the uplands

were equally apt to be infected. There is no better proof of the ignorance of the cause of smallpox in sheep than the multiplicity of opinions on it, which it would be useless to quote. Some authors maintain that the malady may spontaneously develop itself; but whatever may be said to the contrary, the impossibility of a spontaneous generation of smallpox in sheep has not been demonstrated; moreover, some instances are on record where it has broken out in places where the fact of its importation could not be established. M. Gayot's observations, made in the Haute Marne, give evidence of the possibility of the spontaneous manifestation of the malady, which must have been of spontaneous occurrence the first time it appeared. Nevertheless this malady is almost always introduced by contagion, which is effected by the serum contained in the pimples or pustules, of which the smallest particle brought in contact with a healthy sheep will suffice to excite a morbific action. This contagious principle has only to be brought in contact with the skin or the mucous membrane to develop itself, and it may be conveyed by every possible means, such as all animal and vegetable substances. It preserves its dire effects for a longer or shorter space of time, according as it is more or less exposed to the air. The ordinary mode of transmission of the disease is by direct or immediate contact, by the cohabitation or sojourn of affected individuals with the healthy, which is easily effected and as easily explained for by the rupture of the pustules the matter is brought in contact with the skin of healthy individuals, and hence the infection of the greater part of the flock. Mediate transmission is effected by putting healthy sheep in folds or pastures where diseased sheep have been; by travelling over the same roads; by butchers, shepherds, and other individuals, after having handled diseased sheep; by dogs, birds, litter, dung, &c. It has been remarked that the increase of the malady is somewhat peculiar; at first only a few of the infected flock are attacked, then some others in their turn, and so on until about one third have been attacked, when the malady seems to become latent for a time, then shows itself afresh, until the whole have had it. This seems to depend on the fact that the disease is only transmitted by contact at the time of the secretion in the pustules, and not at the time of their desquamation, as has been asserted. In the regular course of an invasion, for instance, the malady is confined to a small number of sheep, and is often very slight, because the emanations are not considerable, and affect only a few individuals; but after this first period the greater number of the flock

are attacked, and the malady is more intense and of longer duration, which is not surprising, as the affection must necessarily become aggravated in proportion as the number of patients increase. Finally, at the commencement of the third period, which generally coincides with the third month, a last invasion takes place of those which hitherto had resisted the contagion. This, like the first, is less violent than the second period; the reason of which is simple enough—those individuals who longest resisted the contagion had less aptitude to take it. From this we may conclude that the duration of the disease is from three to four months in a flock of sheep, but this is not a rule without an exception, as the malady has been known to extend from six to eight months in a large flock of sheep.

Continental veterinary surgeons recognise some three and others four periods in this malady, viz., the invasion, the eruption, the suppuration, and the desiccation. Those who only admit of three periods confound the period of suppuration with that of the eruption. These four divisions are well marked by the different symptoms which are observed on the skin. There is always a state of fever which corresponds with the precursory symptoms of the eruption, and diminishes with the appearance of the pustules, but sometimes increases when the secretion is formed. M. Girard says that, when the malady is accidentally transmitted to a healthy sheep, from six to eight days elapse before the eruption shows itself in warm weather; in cold, a longer time will elapse, particularly if it be wet at the same time. It has been impossible to determine the exact time of the continuance of the pimples, taking into consideration the temperature, the season, the locality, and the age of the individuals. There are such variations that it would be difficult to establish correct data, but generally the eruption, which appears in the shape of small, reddish spots, continues about four days. The pimples shortly after become of a grayish colour. They are situated principally on those parts denuded of wool, and where the skin is fine and the animal heat is most concentrated. Soon after, the centre of these spots becomes elevated, forms a sort of boil in the texture of the skin, and increase in size, and sometimes penetrates through the skin to the subjacent tissue. The tumours are hard and hemispheric in shape. Some are very small, others round, and some depressed. They are either isolated or confluent. The red colour does not long remain; it speedily turns to a white or sometimes bluish hue. The depression in the centre is, properly speaking,

only a sort of flatness. When the pocks have acquired their full development the epidermis which covers them rises up and forms a pellicle of a whitish colour; this pellicle persists until the disappearance of the pustule, but becomes hard and scabby, and ultimately peels off. This period lasts from four to five days.

We may expect that the extent of the eruption being completed, the general symptoms abate, and that then begins in the pustules (under the epidermis which covers them) the secretion of a fluid of a peculiar character, which is the contagious virus of the pox. While this is going on the tumours become white and soft; the serum is of a yellow colour, very clear, almost transparent, and is seen to ooze from the top of the tumours on removing the small pellicle. The virus is disseminated through the whole substance of the skin where tumours exist, and caustically destroys the texture, which causes an accumulation of a whitish substance, sometimes appearing in the form of flakes. This material which is at times greenish, has been erroneously taken for pus. Thus the virus, which in general is not very abundant, is at first limpid, afterwards slightly coloured, and finally white. The secretion does not last more than two or three days; if interrupted, the pustule becomes dry, the malady remains stationary, or else takes a fatal course. The duration of this period is from four to five days. Swelling of the head, discharge from the nose, and other complications, take place from the fifth to the fourteenth day from the time of the eruption. The last period is when the pustule bursts its envelope and forms an ulcer, which leaves an irregular cicatrix. But all the pustules do not break; there are some in which the secretion becomes suspended or completely suppressed, and they disappear as if by resolution. Desquamation succeeds to desiccation. As soon as this commences, the fever, the swelling of the head, the nasal discharge, and all the other symptoms, diminish, and soon disappear; the patient recovers his appetite and his usual health, but it is prudent to keep him for some time longer from healthy individuals. This last period has a longer duration than the others, and it takes sometimes from ten to twelve days before it is complete. It varies according as the eruption has been more or less rapid, or the greater or less number of pustules. But it is not always that these periods follow in this regular order; on the contrary, there are often great variations, depending on the weather, the season of the year, the condition of the animals, &c. When this irregularity takes place at the outbreak of the malady it assumes

different characters; the invasion may last only two days or may extend to seven or eight, but whether of long or short duration, when once it deviates from its ordinary course it is sure to be violent. In this case the symptoms of its outbreak are raised to the highest point of intensity; the fever, anxiety, the pain in the loins, in the limbs, and the abdominal region, the dyspnœa, fetor of the breath, &c., are equally violent; the weakness is extreme, the mucous membranes are pale, and the wool comes off. These symptoms increase after the invasion; the heat of the body is intense, the head is held low, rumination suspended, the mouth is hot and dry, and the thirst is ardent, but the act of drinking is not impeded; the action of the heart is violent and quick. From the first there is a slimy froth from the mouth and an abundant discharge from the nostrils, which is often mixed with blood and of an insupportable odour. Sometimes the nostrils are stopped up with secretion, which more or less impedes the respiration; a cough supervenes, which is distressing to the animal. The eyes are inflamed and swollen, weeping and cloudy, and retracted within the sockets. The eyelids are tumefied and glued together; they sometimes suppurate and become disorganized. The sight is at times lost; the lips, the ears, and the whole head and legs, become excessively tumefied; all the parts affected are very painful. The pustules are united together, and form large sores on the nose and the articulations, and sometimes cause caries of the bones and anchylosis of the joints. In some cases the inflammation of the mucous membranes is so violent that the eruption is arrested. In other cases the inflammation is more confined to the skin, and is very intense and the eruption very considerable; reaction on the mucous membranes, and, consequently, secondary irritation, determine the same symptoms, and cause the same danger. Diminution of the pustules, reabsorption of the secretion, and sometimes diarrhœa, are the signs of speedy death. The animal falls and gives a few convulsive movements. The abdomen is distended and the body infiltrated; at other times the animal dies in a lethargic state.

The medical treatment, according to Gilbert, Tessier, and Girard, should be, not to arrest the progress of the malady, but to promote the eruption; to reduce the quantity of food; not to drench the patient, but to allow him plenty of tepid water, with some meal in it, with which some chloride of sodium (common salt) has been mixed; to put the animals in well-ventilated sheds, of even temperature; to avoid all exciting causes, purgatives and venesection, &c.. These are the simple means recommended. They

are easily applied, and are almost always efficacious when the malady pursues a regular course, and is without complication. The prophylactic treatment consists in isolating the sick, and in preventing all contact by every possible means, and inoculation of unaffected animals.

Some analogy has been supposed to exist between smallpox in man and that of sheep, but this is only apparent in the progress of the disease and in some of the symptoms, but not in its essential characters. On the other hand, the experiment of MM. Campe and Voisin, and those made at the Ecole de Médecine of Paris, and those of the various establishments close to it, have removed all doubts on this point. The results of these experiments were that all the attempts made to inoculate the smallpox from the human subject, and *vice versâ* completely failed, and that sheep which had apparently been successfully inoculated have, notwithstanding, taken the sheep-pox by simple cohabitation with infected individuals. Thus vaccination, the preservative from smallpox in man, does not prove efficacious in that of sheep.

Inoculation.—The object of inoculation is to produce a similar affection to the original disease, but in a milder and more benignant form, and thereby give immunity to and so preserve the flock from the more severe and fatal form of the malady. It consists in introducing the virus of the sheep-pox under the epidermis by a sharp-pointed instrument. It is, without contradiction, the surest and safest means of moderating and lessening the enormous losses caused by this fatal malady. We have no knowledge of the exact time at which inoculation was first practised, but it is not of recent date, and we are indebted for it to the resemblance between smallpox in sheep and smallpox in the human subject. Chalette proposed it in 1762, Bourgelat in 1765, and Coste in 1797. It has been practised in Saxony, Italy, Austria, Hungary, England, and France, at first by Venel, afterwards by Tessier, and by a great number of veterinary surgeons and agriculturists. It has been sometimes favorably spoken of, at others condemned. It excited at first but little attention, and was even abandoned for a time, and it is probable that it would have been entirely forgotten had it not been for the discovery of vaccination, when its effects were more closely observed. It is true that it has not always produced the good effects which were expected; but it must also be confessed that the unfavorable results have been greatly exaggerated, and that often accidents which depended on peculiar circumstances foreign to the insertion of the virus have been attributed to it. Inoculation has had and still has a great

number of detractors, in common with many other valuable discoveries which have not been universally adopted until after many obstacles have been encountered. It is always easier to condemn a new method than to confirm its utility, or to support it by positive facts; but the unfavorable cases of inoculation are very few, particularly when the season and other circumstances have been taken into account, compared with those cases which have been successful.

In the natural course of the malady the losses amount from one third to one half or two thirds; by the inoculation one must be very unfortunate if they amount to one tenth of the animals operated on. Sometimes no loss is sustained, particularly if the inoculation is performed before the malady has invaded the flock, a circumstance which should always be taken into consideration. In a treatise on the inoculation and vaccination of sheep, which appeared in 1822, it is shown that of 32,317 inoculated, 32,121 proved successful, and 196 unsuccessful: of which 31,851 recovered, and only 270 died, which amounts to about 3 in 400. From 31,851 successfully inoculated cases 7697 were afterwards submitted to divers experiments, in order to ascertain their immunity, by cohabitation, &c., with infected flocks, at various stages of the malady, which all went to prove the preservative power of inoculation. M. Guillaume inoculated twenty-seven flocks of sheep, amounting to 10,626 in all; 1883 had had the malady before the inoculation, therefore 9443 were inoculated; of this last number 9077 were successful. This, however, did not prevent the breaking out of the malady amongst those on which the inoculation had been unsuccessful, the majority of which died, while only fourteen died from the effects of the inoculation. Results like these speak for themselves. They are all decisive in favour of inoculation, and are not the results of isolated cases or incomplete experiments. They are deduced from practical obervations on more than 40,000 individuals, and we are indebted for them to men of the highest standing. The best remedies lose much of their efficacy by being applied too late; the same holds good when a flock of sheep in which the malady has already made its appearance is inoculated; it often causes the latent virus to develop itself, and inconveniences—less grave, however, than those consequent on the natural development of the malady—cannot always be prevented. It is, therefore, advisable that every sheep-owner, when the malady prevails in the neighbourhood, should inoculate his flocks before the malady has invaded them, in order to prevent by that means the heavy losses caused by this dreaded epizoötic.

It has been thought that the sheep-pox might prove to be a new preventive of small-pox in man; and to this end children of different ages have been submitted to inoculation, but the punctures were only followed by a little superficial irritation, without any pustular development or suppuration. After having repeated the experiment several times with the same results, these children were afterwards vaccinated successfully. To make sure of the matter used in these experiments, some sheep were inoculated at the same time with the same virus, and which produced the usual successful effect on them. Other experiments have been tried by inoculating fowls of different species, neat cattle, horses, rabbits, dogs, and monkeys, but without effect. The inoculation of the smallpox of man in sheep has also been unsuccessful.

Review.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

On the Growth of the Recruit and Young Soldier, with a view to a judicious selection of "Growing Lads" for the Army, and a Regulated System of Training for Recruits. By W. Aitkin, M.D.

On reading this little book, big, however, with important facts, the mind reverts at once to some remarks in the review of the same work in the *Lancet* for September 6th, 1862, which are so much to the purpose that we cannot resist reproducing one or two of them.

The reviewer says, "How often, not only in the army, but in almost every calling, is the tender frame of the young lad overtaxed;" and again, "Dr. Aitkin may find that he has exerted a wider influence than he anticipated when he published his excellent and useful lecture." These assertions, we will add, are daily verified by experience.

"Age," says the author, "is only one of three most important elements; and when the bones of the skeleton are examined it will appear that up to the age of thirty years the skeleton framework of the body is still growing, and that the whole man is only arriving at maturity. Such a study ought to convince any one of the necessity of the great care

and caution in handling young men or young animals, in order that they may be trained with success without inducing disease" (p. 18).

Again, at p. 20, "Farmers and trainers of racehorses are now beginning to understand the importance of attending to the due concurrence of age, weight, and development, in the training of horses and other animals."

The importance of these remarks we fully concur in. At the same page may be seen a quotation from our Journal, in which the necessity for these considerations has been insisted on, but we are sorry to say that at present there is very little evidence of such a course being adopted. As to age, the author says, "experience has taught Continental states that men are in general not able to surmount the fatigue of a military life under twenty years of age" (p. 22). Again, at p. 23, "When the Duke of Newcastle informed Lord Raglan that he had 2000 recruits ready to send him, he replied, 'Those last sent were so young and so unformed that they fell victims to disease, and were swept away like flies.'" And at p. 45, in reference to physical training, the author remarks, "You can appreciate the feelings of the first Napoleon after the battle of Leipsic, when he said, 'I must have grown men; boys serve only to fill the hospitals and encumber the roadside.'"

These statements should have a wide influence, not only in rearing and training the growing *biped*, but also the growing *quadruped*. If the owners and trainers of racehorses would reason from past experience, or even from analogy, not only their own interest, but more especially that of the public, would be materially enhanced. A complete reformation would soon take place in racing-stables, which could not but tend to an improvement in the management of racehorses, both during their career on the turf and also in the after part of their lives. We should then have less disease, for such horses would be more likely to produce sound, healthy progeny; and when themselves no longer required for the turf, they would be suitable for *chargers, hunters, ladies' saddle-horses*, and many domestic purposes, which under the present system they are quite unfitted for. Can we imagine anything more graceful than an

elegantly formed thorough-bred carrying a beautiful lady, whose seat in the saddle would indicate, if we may use the phrase without offence, that she must be a part of the animal upon which she sits? Compare this graceful animal, in which every bone and sinew of its limbs is as free from disease as on the day he was foaled, with the *broken-down, stilty, stumpy* one, whose legs are deformed by disease, and as rigid as a stick, the result of injudicious management and the putting him to work long before common sense and common humanity would allow he ought to have been.

It is in this way that this noble animal, the most beautiful variety of his species, like the "growing recruit," breaks down long before he arrives at maturity. There are at the present time many colts and fillies not more than one year and three-quarters old, in training, whose legs are suffering from disease from which they will never recover. There are also others (the very best of their day), not more than three years old, whose career on the turf is already at an end, in consequence of the diseased state of their limbs.

We would recommend the 'Growth of the Recruit' to the owners and breeders of thorough-bred horses, and, indeed, to all who have to do either with the growing man or the growing animal. By its perusal they will find much to induce them to legislate for a thorough reform in the breeding, rearing, and running of horses.

The comparative pathologist will also find many remarks which are well worth his consideration. Thus at p. 13 we read, "How do we know that the blights of plants, or the causes of them, are not communicable to animals and to man? We know how intimately related the diseases of man and animals are with famines and unwholesome food, and of famines with the diseases of vegetable and animal life, as much as with the destruction and loss of food."

Most of us can look back and bring to mind periods of blight in the vegetable kingdom, epizoötics among the lower animals, and epidemics affecting the human family. The relative connection these have one with the other may

be said to have scarcely entered into the minds of many pathologists, human or comparative. It is, however, the especial province of the latter to take up the subject, and that in earnest. Here is a wide field for investigation, and a rich harvest may be realised if the cultivator diligently pursues his task.

With these remarks we close our review of a book full of facts and suggestions which are well calculated "to exert a wider influence than the author expected."

ARMY APPOINTMENTS.

War Office, Pall Mall, *Oct.* 3, 1862.

Veterinary Department.—Francis Walker, gent., to be Acting Veterinary-Surgeon.

MISCELLANEA.

It is the privilege and glory of genius to appropriate to itself whatever is noble and true. The region of thought is thus made a common ground for all, and one master-mind becomes a reservoir for the present and future times.

They that govern most make least noise. You see when they row in a barge, they that do drudgery work splash, and puff, and sweat; but he that governs sits quietly at the stern, and scarce is seen to stir.—*Selden.*

OBITUARY.

Died recently, at Manchester, Mr. J. Gibson, M.R.C.V.S., in his forty-fifth year. His diploma bears date May 30th, 1838.

Also, on October 5th, Mr. Lewis E. T. Vicary, M.R.C.V.S., Thorverton, Devon. His diploma bears date August 12th, 1846.

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Communications and Cases.

ON SOME OF THE DISEASES OF THE STOMACH AND INTESTINES OF THE HORSE AND OTHER ANIMALS.

By Professor Brown, M.R.C.V.S.,

Royal Agricultural College, Cirencester.

(*Continued from p.* 642.)

In the last paper we considered the essential characters of this disease, its debilitating effects upon the system, the altered state of the evacuations, and the general derangement of the secretions.

A more detailed examination of the subject will necessitate a classification of the malady under the heads of acute, subacute, and chronic.

Acute diarrhœa most commonly occurs in the horse: its appearance is usually sudden, its progress rapid, and its termination often fatal. The causes which are concerned in its production are various: exposure to cold and wet may be estimated as among the most frequent.

The influence of cold upon the surface of the body is a cause of many internal derangements, not merely from the interruption to the circulation in the cutaneous vessels, but probably even more decidedly from the impression upon the nerves. A rapid transition of the sensation of cold is experienced from the sudden cooling of a very small portion of the surface, and the premonitory shiver may be commonly taken as the first symptom of a febrile attack. From the rapidity with which the phenomena of disease follow the action of the

cause, we are compelled to conclude the nervous system to be primarily concerned; the disturbance of the circulation will follow as a matter of course. It is difficult to explain how this occurs—why a diffused impression of cold should be followed by vascular derangement; but the fact is beyond controversy, that many catarrhal affections, and congestive and inflammatory diseases, proceed from a commencement so apparently trivial.

In discussing this question, it must not be forgotten that the appearance of the symptoms of shivering often indicates the establishment of the disease, so that it has a claim to be considered as a result as well as a cause of the morbid changes. Pursuing the argument to its legitimate termination, we are justified in asserting that cold, produced either by direct contact with a medium of low temperature, or by the evaporation of moisture from the surface, has a tendency to occasion derangement of the circulation in the internal organs, amounting to determination, congestion, or inflammation, according to the intensity of the cause, and the predisposition existing in the system at the time of its action; secondly, that a diminution of animal heat is the necessary result of a preponderance of the congestive element, or of a deficient circulation in the vessels of the skin.

Exposure, shortly after the use of calomel, has been before alluded to as particularly likely to lead to an attack of acute diarrhœa; no reasonable explanation of this circumstance suggests itself to us; but the popular belief that mercury in any form renders the animal body particularly susceptible to the action of cold is certainly not without good foundation. Irritating alimentary matter, or medicinal agents, are for obvious reasons capable of exciting this form of the disease, and in the horse especially there seems to be an irritable condition of the intestinal membrane in every instance of febrile affection, that makes it impossible to employ agents even in small doses that exert a comparatively slight influence in a state of health. The effects of the injudicious administration of aloes, during the existence of pleuropneumonia, or influenza, or bronchitis, and sometimes even in common mucous catarrh, may be advanced as an evidence of the extraordinary susceptibility of the mucous membrane to irritating influences.

After the administration of the salts of antimony, particularly the potassio-tartrate, a moderate dose of aloes will often occasion violent superpurgation; and on the other side, purgation once established by the action of aloes, may be seriously increased by small doses of the tartar emetic.

The occurrence of acute diarrhœa in the crisis of a disease may be a matter of serious concern or not according to circumstances. In some cases of biliary derangement, and in certain forms of indigestion and in many instances of fever, it may be favorable to the resolution of the disease; but in affections of a low or typhoid character, it generally accelerates the fatal termination.

Symptoms.—Acute diarrhœa, as has been remarked, is generally sudden in its appearance, and consequently purging is the first indication of it. In association with this we frequently have abdominal pain expressed, not generally of so violent a character as we find either in spasmodic colic or enteritis; the mouth is hot, and the membrane injected sometimes in patches, or otherwise presenting an uniform dark tint. The somewhat soft and quick pulse will be found usually present in cases of mucous irritation. General symptoms of constitutional disturbance, loss of appetite, dulness, and also coldness of the surface, are only to be reasonably expected.

As the disease progresses the debility, or rather exhaustion, advances to fatal collapse, often in a remarkably short period.

Treatment.—The immediate employment of agents calculated to stay the profuse evacuations is by no means desirable in the acute form of the affection; thus astringents, however mild in their action, are not admissible. Sedatives, such as aconite, are very effective, and may be given at frequent intervals, the dose being from ten to fifteen drops of the tincture in six or eight ounces of water. Bleeding will seldom be necessary, with the judicious use of aconite. Fomentations to the abdomen should be perseveringly continued, and if the inflammatory action is not very acute, mustard poultices may succeed.

Should the purging continue unabated, after a few hours of this treatment, a powder, composed of two drachms of prepared chalk, and half a drachm of powdered opium, may be given in a little gruel as often as occasion may require, until the evacuations are less fluid and less frequent, after which a few drachm doses of "Hyd. cum cretâ" may be advantageously administered, and continued until the natural secretion is restored.

In the convalescent stage it seems better to trust to properly selected diet and careful nursing, for the restoration of health, than to attempt to accelerate the progress of cure by tonics, which not unfrequently occasion a relapse.

Dietetics.—The necessity for avoiding all irritating mat-

ters is at once apparent. During the acute stage all solid food should be withheld, and gruel of flour, and linseed emulsions, substituted in its place; and even when considerable progress has been made towards a restoration of health, much discrimination is necessary, to avoid a recurrence of an irritation to which the mucous tissues are now especially prone.

(*To be continued.*)

DISEASE OF THE URINARY ORGANS OF A COW.

By Messrs. Rose and Perrins, M.R.C.V.S., Worcester.

Dear Sir,—I have forwarded you a specimen of disease which I took from a cow. The history of the case is as follows:

The cow calved well six or seven weeks since, the "cleansing" remained a few days, and a common draught was given, which was repeated, when it came away, and all went on apparently well, excepting that she lost flesh. On the 10th she appeared to have some difficulty in voiding her urine, and a foreign body was seen in the vagina. On the 12th we were requested to see her, which my uncle and myself did on the 13th. What is sent to you was protruding from the vagina, and, on taking hold of it, it easily came away. The animal immediately afterwards passed about two quarts of urine, one half in full volume, the other slowly. The man said he saw her void about a gallon in the morning. She has gone on much the same ever since, and passes her urine in the same manner. On the 20th we saw her again, when she was looking quite as well, if not better, than on the 13th; and she urinated in our presence without any difficulty, but certainly not in quite a natural manner. I make no further remark, only that we shall be glad of your opinion as soon as convenient.

I remain,
Yours obediently,
H. B. Perrins.

To Professor Varnell.

P.S.—There was a slight rupture, but we have made it larger by taking some away for examination by the microscope.

OBSERVATIONS ON THE CASE BY PROFESSOR VARNELL.

As will be seen by the communication, some morbid parts were sent to me for an opinion. The case, however, belongs more especially to Professor Simonds' department; and into his hands I should have placed it, had he not been so fully engaged in the west of England in investigating sheep affected with smallpox. I, therefore, under these circumstances, have undertaken to make a few remarks on this, to me, unusual case.

Since receiving the above letter I have seen Mr. Rose, who informed me that the disease has awakened much interest in the minds of the medical men of his town, who have taken some trouble in investigating the morbid parts, with a view of understanding the character of the disease. What are the views these gentlemen have taken of the case I have not been favoured with, but it must have been gratifying to Mr. Rose and his young partner (it certainly is so to me) to find the members of the medical profession devoting a part of their valuable time in investigating the diseases of the lower animals. I have no doubt, however, that the practitioners of human medicine can obtain much valuable information by studying comparative pathology; and I am also confident that we, as comparative pathologists, may also receive many valuable hints on this subject from medical men. Whatever may be the feelings of my professional brethren on this point, I for one am bound to acknowledge the assistance I have from time to time received from such sources.

The history received with this case is very brief; nevertheless it forms a basis upon which to form an opinion—at any rate, a hypothetical one.

Examination of the Specimen which accompanied the Letter.

It consisted of what a casual observer would have taken for a urinary bladder, with the urethral canal and about one half of one of the ureters. The shortness of the urethra would have suggested that it was taken from a female. At the anterior fundus of the specimen an irregular opening existed, which is stated in the letter to have been made for the purpose of obtaining a portion for microscopic examination. Its external surface throughout was rough, as was also the inner; but in this respect they differed materially from each other. The appearance of the former was that of a false

membrane, which had been stripped from off a part it had been attached to; while that of the latter was similar to a free surface which had been constantly bathed by a fluid containing some colouring matter capable of staining the tissues it came in contact with. The whole of the inner surface presented a grayish-purple colour, which was not the case with the outer surface.

It required but little reflection to determine the character of this *pseudo* membrane, but the part whence the material out of which it was formed came is not so apparent. The first impression would be that it came from the surface of the mucous membrane of the organ which it formed a complete cast of, namely, the urinary bladder, a part of one of the ureters, and the urethral canal; but the investigation we subsequently had an opportunity of making of other parts rendered this somewhat doubtful.

But to continue our examination of the specimen under consideration. Its structure was identical with those layers of lymph we so often find deposited on the pleural coverings of the walls of the thorax or surface of the lungs, which, if torn off, show indications of fibrilization, in this respect similar to what is observed if a small quantity of blood, minus the red cells, is placed on a piece of glass. This, if allowed to remain for a time, will, when examined with a moderately high magnifying power, be seen to have arranged itself in lines mostly parallel with each other. The parts, as seen even with the naked eye, had the appearance of being made up of bundles of fibres, held together by an intermediate substance, their course being that of the long axis of the specimen; but what could have determined this direction I am not prepared to state. Generally, when fibrine coagulates, its apparent fibres are interwoven in all directions, like felt, and when hardened in spirit, or in a solution of bichloride of mercury, it becomes tough and leathery to the feel; which is the precise character of the specimen. There can be no doubt of this false membrane being formed by a material the product of diseased action, but from what organ it was thrown out we have yet to determine.

No further investigation of the case took place until the 1st of October, when Mr. Rose came to the College, bringing with him the vagina, uterus, bladder, and kidneys of the cow from which the morbid parts we have hitherto been alluding to were taken. Mr. Rose informed us that from the time of the cow's calving to the period of her being slaughtered she became so much emaciated that it was deemed advisable to have her destroyed; which being done, he availed himself of

the opportunity of securing the organs we have just named, and which we have since carefully examined.

The vagina was quite healthy, as was also the uterus, as seen externally, but its mucous membrane appeared to be considerably thickened, and its surface of a dark-brown colour, more so in some places than in others. I am not sure, however, whether this condition is not such as might be considered consistent with the period which had existed after parturition, or whether it must be looked upon as abnormal. But even should the latter be the case, I cannot conceive that it had any *direct* influence in producing the false membrane before alluded to. *Indirectly*, perhaps, it may have had something to do with it. The ureters appeared healthy, with the exception of the left one, and that at only one small place, about nine or ten inches from its termination, where there was a partial stricture. The bladder was unusually contracted, which gave a thickened appearance to its coats; but I could not detect that either of them was diseased, with the exception of the inner, the mucous coat, which evidently was thicker than natural, and there were dark-red patches here and there on its surface, apparently the result of stain from some colouring matter that had come into contact with it. The urethral canal and the openings of both ureters were quite natural. The kidneys were both enlarged, from their structure being infiltrated by serous exudation; the surfaces of several of their calices were ulcerated; the lining membrane of the pelvis of both was much thickened; in some parts it was of a dark-brown colour, covered by a thick, tenacious, darker matter, and which, in those calices that were ulcerated, was of a dark-red or brick-dust colour.

Mr. Rose suggested that the affection in these glands was analogous to Bright's disease, and it certainly is highly characteristic of some of the forms of that malady, perhaps identical with it.

We may now offer a few more remarks on the specimen first sent, viz., the false membrane, which, as before stated, is a cast of the interior of the bladder, &c., to the surface of which it had, no doubt, been attached. But the question arises, was it produced from this organ, or was it secreted from the kidneys, being the result of diseased action, and, having passed to the bladder, became deposited on the inner surface of that organ in the form we found it? I incline to the former opinion. I think, however, that the kidneys were primarily diseased, and that the mucous membrane of the bladder was secondarily affected (some would describe this occurrence as metastatic), not, perhaps, at any time in a very

acute form, but in a state conducive to the throwing out of a large amount of the plasma of the blood, which coagulated on the surface of the mucous membrane; and this morbid deposit gradually increased, by the continuation of the diseased action, until it acquired its present thickness. If I am right in supposing it to have been a product of the mucous membrane of the bladder, I can understand that, when the abnormal action partially or wholly ceased, the bond of connection between the true and false membrane would be weakened, and perhaps slightly detached, very likely at the entrance of one of the ureters, when the urine, under such circumstances, would find its way between the inner surface of the mucous membrane of the bladder and the false membrane, until the whole of the latter would have become completely freed from the surface to which it was attached, and be finally expelled from the bladder in the way stated in Mr. Perrins' letter.

I think that fibrinous exudations, the result of disease of the kidneys, would, when passed into the bladder, if not evacuated in a fluid state, coagulate in the form of flocculi, or in bands partially stretching across from one part of this viscus to the other. Shreds of lymph might occasionally have been passed with the urine, or they might temporarily obstruct its passage through the urethral canal; and if the bladder had been examined immediately after death, such flocculi might be found floating therein.

I have thus very briefly stated my reasons for supposing that the false membrane was a product of the inner coat of the urinary bladder, the result of morbid action. I shall not attempt to account for the disease in the kidneys of the cow, nor the effect it had, or might have continued to have, upon the general health of the animal, had she been allowed to live; but, in conclusion, simply state that, so far as the morbid specimen is concerned, it stands alone—that is, I am not aware of another instance recorded in veterinary literature.

POISONING OF PIGS WITH COMMON SALT.

By H. Pyatt, M.R.C.V.S., Nottingham.

On 20th October I was sent for into the country to see some pigs, which were stated to be seriously ill from some unknown cause.

On my arrival there I found five of them were dead and several more condemned, and all of them in a very precarious state; in fact, we were obliged to have three or four more killed immediately, or they would have died.

Upon making inquiry respecting their management and the character of their food, I found they had been fed upon wheat-flour which was made from the rakings of the farm, boiled potatoes that were diseased, and fusty bran; which I certainly thought at the time was rather peculiar diet.

The general symptoms presented were—loss of appetite, thirst, and dulness. There was likewise a certain amount of flatulence present, which was accompanied with diarrhœa. Vertigo and convulsive movements also existed, all the animals having epileptic fits to a greater or less extent, and these rapidly increased as death approached. There was also constant champing with an accumulation of foam around the mouth, and they were constantly shaking their heads. The mucous membrane of the mouth was very pink in colour, or rather approaching to a red hue. The eyes were bright and the pupils dilated, and many of the animals were totally blind. After a time they were unable to stand, and ultimately the hinder parts became paralysed, and in the course of from eight to twenty-four hours after the first symptoms were presented they died in convulsions.

Some of the animals being dead, afforded me an opportunity of instituting a *post-mortem* examination, which, however, at that time and place I was unable to do very minutely.

Upon opening the abdomen and exposing the intestines, there was seen general inflammation extending throughout the whole of them. The stomach was very much inflamed, the mucous membrane very dry, and stained in different parts by dark-black blood, which was infiltrated into its substance.

On the 22nd of October I again saw my patients, and found that the owner had been obliged to kill another pig, weighing sixteen stones. It being left for my inspection, I accordingly made a *post-mortem* examination, and found the appearances much the same as in those I had examined the previous day.

By close inquiry I now ascertained that the animals, twenty-six in number, had been, and, indeed, were at this time, having mixed with their food a stone and a half of salt in three days.

I brought a little pig away with me. It was suffering very much, and had severe epileptic fits, which gradually increased both in frequency and duration as night approached.

I did this because I was of opinion that the symptoms arose from the food the pigs had been eating. If a stone and a half of salt were given every three days to twenty-six pigs, it follows that every pig would take daily, on the average, about ℥iv, ʒiv, ℈ij. I therefore advised that their troughs should be washed out, and their food changed to mangel-wurzel and gruel, and not to be allowed a particle of salt.

October 23rd.—Upon visiting my patients this morning I found there had not been any more fatal cases since the previous day, and that everything was progressing in a favorable direction. I again advised that they should not be allowed any salt, as I was decidedly of opinion that was the cause of all the mischief, but they were to be kept upon the diet ordered by me the previous day.

The little pig died this morning, and, as it was at my place, it afforded me an opportunity of entering more minutely into a *post-mortem* examination, and the following were the lesions presented:

General signs of gastro-intestinal inflammation, with more or less irritation of the urinary organs. The mucous membrane of the stomach dry, and stained here and there in black spots by infiltrated blood. There was also a certain amount of infiltration of blood into the cerebral substance; the chief parts affected were the cerebellum and medulla oblongata; the membranes covering them were likewise injected with blood, and there was also a certain amount of blood extravasated. A small quantity of serum was thrown out between the pia mater and cerebral substance, which was very dark in colour.

24th.—No more fresh cases have occurred, and all are progressing favorably. Ordered the food to be continued as on the former day.

25th.—I again saw my patients, and found them all to be progressing favorably; indeed, we have not had a case since I visited them on the 22nd. I ordered their food to be changed to raw mangel-wurzel, and I think I may now say that they are all convalescent.

I feel perfectly satisfied that all the mischief has arisen from the quantity of salt the pigs were eating, for we have not had another case since I changed their food to raw mangel-wurzel and gruel, which gruel was made from the flour they were eating at the time they were first attacked, thus proving that it was not the cause of the affection.

I have not the least doubt but that some of the larger pigs were getting five ounces of salt daily.

I forward a jar containing the stomach, &c., to Professor Tuson, for analysis.

PROFESSOR TUSON'S REPORT.

SIR,—I beg to report that I have analysed the stomach and ingesta of a pig received from your son October 23rd, and which had apparently died from the effects of an irritant poison. The poisonous agents sought for included arsenic, antimony, mercury, lead, copper, zinc, the common mineral acids, &c., but neither of these substances was discovered. Having heard that common salt in considerable quantity had been administered in the food of the pigs, I made special search for that substance, and readily detected it in the stomach and ingesta which you sent me for examination.

That common salt was the agent which killed the pigs entrusted to your care is, I think, almost certain. This opinion is corroborated by the subjoined statement of Dr. A. S. Taylor, in a report which he made on a case of "Poisoning of Pigs with Common Salt," communicated to the *Veterinarian* for 1859, by Mr. Robinson of Tamworth. After stating that common salt was the only substance found in the stomach which he examined, capable of acting as an irritant poison, Dr. Taylor says, "I have known several instances in which pigs have suffered from the effects of a large quantity of common salt, when it had been thrown into the trough and loosely mixed with the food. The quantity of salt, however, in this case, was not excessive, and the trough food contained less than the cistern food. The cause of death may be explained without reference to the food, but, at the same time, I may state that common salt, in large quantity, is an irritant, and in at least two instances has destroyed human life." In an additional note Dr. Taylor remarks that, "From the actual quantity of common salt found in the stomach, it would have been impossible to assign death to this substance acting as an irritant poison. All that could be said from the result of the analysis would be that, assuming the salt found in the stomach to have been the residue of a very large quantity taken by the animal, this might account for the inflammation of the stomach and death. In two instances, referred to me some years since, there was strong reason to believe that pigs had been destroyed by common salt acting as an irritant poison."

I am, Sir,

Your obedient servant,

RICHARD TUSON,

Professor of Chemistry to the Royal Veterinary College.

To HENRY PYATT, Esq.

CASE OF PURPURA HÆMORRHAGICA IN A COLT.

By A. H. Santy, M.R.C.V.S., Market Deeping.

The subject of the above disease was a two-year-old cart-colt, and the following is a detailed account of the symptoms presented.

On Sunday, the 14th September, I was requested by Mr. Bullimore, of Deeping St. Nicholas, to attend a colt reported by him to be swollen all over. Arriving at 3 p.m., I found that the colt had been taken up from the field that morning, and was placed in a hovel. Mr. Bullimore stated that, since then, the swelling had increased very much. On the previous Thursday the animal was first observed to be not very well, and on Friday he was rather lame of one of the hind legs. On Saturday he was worse, and all this time no further notice was taken of him, except merely looking at him, as the person who went to the field thought he did not ail much.

Symptoms now present.—Anxious and dejected countenance; partial sweats; extremities warm; breathing laboured; pulse very feeble, and about 80 in the minute; bleeding from nostrils; petechial spots on the Schneiderian, buccal, and conjunctival membranes; a large, diffused, soft swelling over the parotid gland on the near side, another on the near elbow, and another at the posterior part of sternum; the hind legs are very much swollen, as high up as the thighs; the fore legs are not quite so much enlarged, but they are so much increased in size as to have lost all shape. Below the knees and hocks, when I passed my hands down, on withdrawing them they were covered with blood, and blood and serum could be seen oozing out of the skin. Not much appetite.

Treatment.—I had the animal led into a loose box, which was effected with great difficulty. I then administered the following draught:

℞ Spt. Nit. Æth., ℥iiss;
Sol. Aloës, ℥iv;
Ale, Oj. Misce.

Three hours after I gave—

℞ Spt. Nit. Æth., ℥iss;
Liq. Amm., ℥ss;
Brandy, ℥ij;
Aquæ, q. s. Misce.

And at 10 p.m.—

Ol. Tereb., ℥ij ;
Ol. Lini, ℥iij ;
Æth. Sulph., ℥j ;
Brandy, ℥ij. Misce.

Warm fomentations and Tinct. Arnica lotions were applied to the swellings.

On Monday, 15th, at 6 a.m., the draught, ordered last night, was repeated. At 7 a.m. I saw my patient. He was still bleeding from legs and nostrils, and the swellings increased; he eats very little; the pulse and breathing were much the same as yesterday, the former very feeble. I ordered glysters of soap and water to be thrown up, changed the fomentations from warm to cold water, and sent the following draught to be given at 10 a.m.:

℞ Ol. Tereb., ℥j ;
Ol. Lini, ℥ij ;
Brandy, ℥j ;
Æth. Sulph., ℥j. Misce.

This was repeated at 1 p.m. and at 6 p.m. The animal had not been seen to urinate or void dung when I was there in the morning. I saw him again at 8 p.m. The swellings had increased; the lips also were beginning to swell; blood still escaped from the legs and nostrils; the thighs were enormously swollen. Continue to apply the cold water. Some fæces have been passed, which are pultaceous, and he has voided a large quantity of urine during the day, of a high colour. Arnica lotion to be continued in use; no medicine to be given.

Tuesday, 16th, 8 a.m.—The lips are enormously swollen, and the nostrils also, threatening suffocation. Bleeding from the near eye, the conjunctival membrane of which is highly injected and covered with purple spots or patches; the swellings generally have increased; he can eat nothing, but drinks oatmeal gruel; the extremities are warm, the pulse is scarcely perceptible. Gave—

℞ Ol. Tereb., ℥j ;
Æth. Sulph., ℥j ;
Brandy, ℥j ;

in draught, and repeat it at noon. I scarified the lips well. The animal died at 4 p.m.

Post-mortem examination.—The man had unfortunately cut the carcasses up before I got there, but the skin presented all the appearance of purpura, and consequently the legs, the head also, and part of the neck. The man said that, when

he was cutting the head off, a quantity of fluid gushed out; the lungs were healthy in structure, but the pleura pulmonalis looked much like the skin; the intestines were healthy, but the spleen was very much enlarged; the liver also, and of a clay colour; the pericardium and the diaphragm participated in the disease.

[The appearances of purpura hæmorrhagica are so well known and easily recognised, that we have not thought it necessary to have Mr. Santy's sketch engraved, &c.; for which, however, we thank him.]

TUMOUR TAKEN FROM THE BACK OF A MARE.

By G. Longman, M.R.C.V.S., V.S. 9th Lancers, Brighton.

My dear Sir,—I have sent you "per rail" to-day apparently an ossific tumour, taken by me from the back of an officer's charger. It was situated on the side of the back, about six inches from the spinous processes of the dorsal vertebræ, and about opposite to the fourteenth rib. It was immediately beneath the skin, imbedded in cellular tissue, quite loose, and had no connection either with the skin, bone, muscles, or fascia. It was easily removed by a crucial incision being made through the skin, when with very little force it came out, almost in the same state as I send it to you.

On making an incision into it after its removal, which I did with difficulty, I perceived it to consist mostly of what appeared to me to be bony matter, with a little fibro-cartilage; and as I never remember seeing so large a deposit unless in connection with bone, I thought it worth sending to you, and shall be pleased to have your opinion on it.

The history of the case is as follows:—The subject of the tumour is a brown mare, six years old, and ridden as a charger. About twelve months since she had first a slightly galled back, from which she recovered after having been blistered, and was then sent to work. When I saw it, in December last, the tumour was about the size of a small pea. I ordered a mild application of iodine, and then sent her to work, to be ridden regularly. In February there was still a slight thickening beneath the skin, and the animal was then worked both as a hack and charger, as she did not seem to suffer the slightest inconvenience from this tumour. About

August last my attention was again directed to it, as it had become so much larger. I then found it about half the size it now is, loose and unconnected; and, although the mare was ridden every day, she continued not to manifest the slightest inconvenience from the tumour, neither was there any swelling around it. She continued her work up to the present time, when her owner going away for a little while, he wished me to remove it, as it looked unsightly, which, of course, I did.

I thought it might prove a thickened state of the cellular tissue merely, as it was situated immediately beneath the skin and over the muscles of the back, being some distance from any bony structure. After the operation the lips of the wound were drawn together by a few sutures, and the wound is healing fast.

I remain, dear Sir,
Yours truly, &c.

Professor VARNELL.

REMARKS ON THE ABOVE BY PROFESSOR VARNELL.

The tumour referred to in the above communication must not be considered as true bone, which, from its hardness and weight, it might be taken for. It is composed of a fibrinous stroma, in which is deposited a quantity of earthy matter, but is unlike true bone in being wholly destitute of the Haversian system of canals for the passage of blood-vessels.

I have met with similar formations, when dissecting, in various parts of the body. I have found them in the coats of large arteries, in the subperitoneal tissue, but more especially in the subcutaneous tissue of the old, ill-used ass. In these poor animals, depositions of this nature are more often found in such parts as have been exposed to injury from the saddle, collar, or some other portion of the harness, or from what is worse, the unmerciful blows inflicted by the driver, or the sharpened end of a nail, so commonly used to compel them to perform their work. The continued irritation thus induced results in the effusion of lymph and calcareous matter in solution, into the areolar tissue; the former becoming a sort of matrix for the latter to become imbedded in, in a solid form. These deposits, which are slowly produced, after a time become condensed, and from the almost continued motion of the skin over the fascia they are often partially or wholly detached from the surrounding cellular tissue.

I can imagine that the present specimen was produced somewhat in the same way, and had it not been removed would have acted as a foreign agent, and if pressed upon to any extent by the saddle or harness might have produced inflammation of the surrounding parts. It was judicious, therefore, on the part of Mr. Longman, to remove it. The tumour measured two and a half inches long, and one and three quarters wide. In its central and thickest part it was one fourth of an inch thick, gradually becoming thinner towards its edges.

The case, in many points of view, is interesting.

Facts and Observations.

ECZEMA EPIZOOTICA.

A FEW months since we recorded the fact that *eczema epizootica* was prevailing to a serious extent among the cows in the metropolis, and that many animals had fallen victims to its malignancy. We have now to inform our readers that the disease has reappeared in a severe form in the metropolitan county, and that it is also again proving very destructive to the lives of cattle in several of the surrounding counties. It will, then, be seen that the laws regulating the extension of this disease require even a more searching investigation than they have hitherto received.

EFFECTS OF NOXIOUS VAPOURS.

IN the minutes of the evidence taken before the select committee appointed by the House of Lords during the last session, "to inquire into the injury resulting from noxious vapours evolved in certain manufacturing processes," the state of the country round St. Helen's is described as "one scene of desolation; you might look round for a mile, and not see a tree with any foliage on whatever." The acid vapours have done it all. As these drift around, trees lose their leaves, the tops decay, the bark hardens and becomes adherent, and, after a struggle for life, which lasts a year or two, the trees perish. Apples have nearly disappeared from the neighbourhood. Where twenty bushels used to be gathered, only a measure or two can be got now. Hedges

have fared but little better. The sturdy hawthorn makes an attempt to look gay every spring; but its leaves, as they come out, dry up like tea-leaves, and soon drop off. The farmer may sow if he pleases, but he will only reap a crop of straw. The ears will have nothing in them. Grass grows, but it soon turns brown, and, for all the good it is, it might as well not grow. Cattle will not fatten on it; and, worse still, it makes sheep throw their lambs. Cows, too, in some situations, more exposed to the vapours, get a cough, and cast their calves; and the human animals suffer from smarting eyes, disagreeable sensations in the throat, an irritating cough, and difficulty of breathing.

Swansea has suffered as much as St. Helen's. The immediate district, which is subjected to the direct and concentrated influence of the copper smoke, is entirely denuded of vegetation; the hill-sides have not a blade of grass upon them. Here sulphurous acid and arsenic are the noxious vapours. The effects of arsenic only extend a few hundred yards, but within this area poison everything. Grass grows, but kills the animals that eat it; and, instead of having their appearance improved, as common belief would have expected, ponies fed on arsenical grass acquire a peculiar shaggy and starved appearance, their knees swell, they get lame and hide-bound, their hair falls off, and their teeth fall out, and necrosis supervenes. No wonder that the farmers give up grazing on such tracts of land! the influence of the sulphurous-acid vapours extends for miles, and is seen principally upon vegetation. It burns up the leaves, checks the natural growth, and stunts a plant. One witness showed specimens of plants which presented the appearance of having been exposed to a sirocco.

THE INDIAN REMEDY FOR SMALLPOX.

In a previous number we inserted a so-called remedy for variola—*Sarracenia purpurea*—(see p. 592.) It is stated, in the *Medical and Surgical Reporter and British American Journal*, that, at a recent meeting of the Medical Society of Nova Scotia, held at Halifax, the subject was discussed, and a resolution passed to the effect, that "there were not any reliable data upon which to ground any opinion in favour of its value as a remedial agent."

A DIFFICULT INVESTIGATION.

Among the proposed scientific inquiries is the following one, full of interest, but very difficult of solution, we opine :—"To investigate the nature of the substances contained in the vapour produced by the respiration of man and animals in a state of health ; which is to be extended, if possible, to the substances exhaled in certain maladies, contagious ones especially, and this not only in reference to chemical analysis, but also an examination of their hurtful effects in different animals."

OZONE.

In a letter to Professor Faraday, Schönbein writes—"After many fruitless attempts at isolating ozone from an ozonide, I have at last succeeded in performing that exploit ; and have also found out simple tests for distinguishing with the greatest ease ozone from its antipode, 'antozone.' As the production of ozone by purely chemical means, the whole secret consists in dissolving pure manganate of potash in pure oil of vitriol, and introducing into the green solution pure peroxide of barium, when ozone, mixed with common oxygen, will make its appearance, as you may easily perceive by your nose and other tests. By means of the ozone so prepared, I have rapidly oxidized silver at a temperature of 20° C., and by inhaling it produced a capital 'catarrh.'"—*Philosophical Magazine.*

FATTENING PROPERTIES OF COD-LIVER OIL.

A farmer of Haubourain (Nord) has just tried the experiment of accelerating the fattening of cattle by the use of cod-liver oil. The trial was first made upon two calves, eight sheep, and two pigs. The result surpassed all expectation ; in ninety days they were all in prime condition, the flesh being perfectly white and of easy digestion. The quantity given was—to the pigs, sixty-three grammes (two ounces per day) ; to the sheep, thirty-one grammes. For the calves the oil was mixed with bran and chopped straw, for the sheep with bruised beans, and for the pigs with their regular food.

THE VETERINARIAN, DECEMBER 1, 1862.

Ne quid falsi dicere audeat, ne quid veri non audeat. —Cicero.

DO WE PROGRESS?

This may not be an inappropriate inquiry at the close of the year, now that another has nearly rolled away into the eternity of the past. But to answer it we must make comparisons, and these, we are told by some persons, "are odious." Yet it is only by them that we can satisfactorily arrive at a solution of this question. We do not, however, hesitate to assert that we have both progressed and are progressing. For a proof of the first position, we have only to look at the state of the profession as it now is and as it was fifty years ago. How marked has been its advancemont! But to particularise all that has been done would occupy both more time and space than we have at our command.

We are not, however, among those who repudiate and contemn the past; not like the free-thinkers and atheists of the last century, who were wont to say that they wished all past history buried in oblivion; they forgetting that without the past the present would not have been so far advanced. It is not true that our forefathers were fools, and the theory is absurd which supposes that there has been in mankind a gradual advancement to its present state of knowledge. Much has been forgotten and lost, for "man was formed upright, but he has sought out many inventions." He was perfect when he came out from the hands of his Maker.

As a proof of the second position, we believe we may as confidently refer to what is now taking place among us. No longer can the body be satirically said to be represented by the counterpart of Ezekiel's valley of dry bones. And yet we nevertheless think that a comparison in a certain sense may be made, for "a noise is heard," and "behold a shaking,

and the bones are coming together, bone to his bone." Soon, too, there will be seen there is life in them, and that we have become "an exceeding great army."

Ever have we been advocates for union, although we have not counselled or hoped for uniformity. Indeed, this is both morally and physically impossible; nor is it desirable that it should exist, for did it, it would prove disadvantageous, inasmuch as it would act as a barrier to all investigation, and consequently to all progress. A forced conformity is repugnant to a well-educated and disciplined mind. Moreover, it is by differences of opinion that truth is elicited, and investigations, when carefully conducted, result in the acquirement of knowledge. On this ground it is that even controversies often prove beneficial, although it is too frequently to be regretted that they lead to the formation of parties, and give rise to personalities, ever to be denounced.

As a further proof of our onward progress, we cannot but recognise and approve of the advancement that has been made in professional education. The curriculum of the student is extended, fresh appointments have taken place of professors in several departments;—although we must not stop here;—yet, the examination for the diploma of the College has become systemized by each section having its respective examinators; associations are being instituted for the discussion of scientific and other subjects connected with the veterinary art, and societies formed for mutual protection.

And may we not also refer with some degree of confidence to the increased estimation in which the graduated member of the profession is held by the public? The nostrums and musty recipes of the empiric have followed the "charms" of the charlatan, and ceased to inspire confidence; while bold assurance and pretension to knowledge have paled before the light of science, which, like the touch of Ithuriel's spear, has exposed their true nature, and shown the origin of them to have been in ignorance of right principles.

It is with communities as individuals—the tide taken at its flood leads on to fortune. So with us, a current has for some years set in the right direction, and although all

has not yet been done we hope to see done, nevertheless much has been accomplished. It is something to be recognised as a professional body; and while there will ever be pretenders to our art, only let the conduct of each member be such as to give proof to his employer of the advantages to be derived from the application of scientific principles, thus gainsaying the aspersions that are sometimes cast by the ignorant charlatan upon the man of education, who, guided by light and reason, pursues the even tenor of his way, knowing it to be correct, and we have no apprehensions as to the result. In the end the anticipated goal must be reached by him, and he will have cause to triumph, though, perhaps, he may have laboured long and hard. Let "nil desperandum" be his motto, and ever let him keep in view as the pole-star for his course of procedure scientific truth, and he cannot err.

"Ignorance is the curse of God,
Knowledge the wing wherewith we fly to heaven."

It is satisfactory to know that we are not standing still—not become as a stagnant pool, that sheds forth pestilential vapours, but are rather like a goodly river, which, having received many tributary streams, is in its course communicating fertility and life. As our numbers have increased, so has our usefulness, and the community being now pervaded by a consciousness of this, our worth is estimated; and this will ever be in proportion to the motives by which we are actuated. Well has it been said, "Motive is the spring of all mental action. God has framed us with the susceptibility to impressions from the outside world. We are affected, by considerations of interest or injury, towards good or towards evil. We are free: there can be no doubt about that; but we are not independent of influences. We are, if we will to be, above the control of circumstances; but circumstances are not ineffective, pressing, as they do, upon us so closely, they are helpers to confirm us in the right, or tempters to lure us to the wrong. We are not their vassals; they have no original power over us, like the power which a master affects over a slave. They are themselves vassals to a higher Cæsar, and pay tribute to the

regal conscience and to the lordly will. But with this reservation, they are mighty in their influence, and incline our hearts full often to yield to them. Now, it is just this balancing of motives, the rejection of this and the acknowledgment of that, by the soul in its grand assize, which makes up that which we call character; and every moment of our lives is tributary to that, for life itself is only one long term-time, and the court of conscience sitteth every day."

Science is ever striving to extend the bounds of human knowledge, and to shed its illuminating rays on subjects seemingly wrapped in clouds of impenetrable mystery. By its theories at the present day it surpasses the discoveries that awakened the astonishment of past generations, many of which were ill understood, and their causes referred, consequently, to vague and uncertain agencies.

We have been told that science should be loved for its own sake, neither counting its cost nor its reward, but simply because of its usefulness. We fear, however, that such is the perverseness of human nature, that the hope of gain will always more or less actuate its votaries, regardless of the accusation that, like Bunyan's man with the mud-rake, they will thus become engrossed with ignoble cares, and contented to rake together straws and mud instead of reaching forward to the golden crown which is within their grasp. Certain it is that the rewards connected with veterinary medicine are not large. They may, therefore, be said to be intrinsic, and the motives by which the practitioner is actuated are purely philanthropic, since to do good to those animals placed lower in the scale of creation than himself is his object, and in the fulfilment of his duty he obtains his guerdon. Nevertheless, by perseverance, probity, and the honest exercise of those talents God has endowed him with, a moderate competency might be gained, so that in the autumn of life he may not only relax and obtain rest from the more laborious part of his profession, but retire, if he so will, and enjoy his *otium cum dignitate*. Having earned the respect of his fellow-men, he will nevertheless still desire to be useful, remembering with Lytton, that rest for a well cultivated mind is not abstinence from thought nor abstinence from study, but change of both. "A brain

habitually active will not be ordered to rest. It is not like the inanimate glebe of a farm, which, when exhausted, you restore by a simple precept—let it be fallow. A mind once cultivated will not be fallow half an hour."

VETERINARY PROTECTION SOCIETY.

We are desirous of reminding our readers that the "*Veterinary Protection Society*" is continuing its efforts to establish itself upon a broad and lasting basis; and although much has been done, still, to secure success, more support is needed, and the committee is therefore anxious to receive the names of additional members as early as possible. Communications should be addressed to Mr. W. H. Coates, 10, Red Lion Square, who has kindly consented to act as Hon. Secretary.

Extracts from British and Foreign Journals.

DEATH OF A BOY FROM GLANDERS.

An inquest was opened at the Guildhall, Bath, on Friday evening, September 26th, by A. H. English, Esq., the city coroner, on the body of a boy who died from glanders.

In opening the case to the jury, the coroner remarked that they had to inquire into the cause of the death of a lad named Isaac West, aged fourteen, who died at the Bath United Hospital, on Wednesday morning, from, it was supposed, the effects of glanders communicated to him by a horse, and inasmuch as the necessary witnesses were not present, after the jury had viewed the body he should take some medical evidence, and then adjourn the inquest. The case was a serious one, for if it should be proved that the owner of the horses entrusted to the care of the deceased was aware of their being diseased with glanders, they would have to decide how far, under the circumstances, he was responsible for the boy's death. In order to render him responsible, it

must be proved that he had some knowledge, and being aware of it they would have to judge how far he could be presumed to know the fatal nature of the disease. If such knowledge should be brought home, it would be not merely a case for blame, but an offence which the law would regard as manslaughter. If a man placed a savage bull in a field where there was a highway to the public, and death resulted by an attack from the animal, the owner would be responsible. The same would apply to a horse. If it had a disease which would communicate infection so as to kill a person, the owner could not certainly be allowed to escape with impunity, and not be considered responsible. The consequences would be most serious. It would be necessary, first of all, to learn whether the owner was aware of the existence of the disease, and then whether he entrusted the boy with the horses. It would also be requisite to ascertain if the boy himself was informed of the existence and nature of the disease; if he was, it might go to lessen the responsibility of the employer, but if he was ignorant, the case against him would be strengthened. He thought the inquiry might be attended with some difficulty as to ascertaining who the responsible persons were, but it must be prosecuted, on account of its serious character. It might be that some other persons had been placed in charge of the infected animals, and their lives would be endangered. Having cautioned the jurors not to touch deceased, the coroner desired them to view the body. On their return,

Mr. F. Stockwell, house-surgeon of the hospital, was sworn. He deposed—Deceased was brought to the hospital last Saturday week, on a ticket of admission given by Mr. Feare, of Camerton, the agent of J. Jarrett, Esq., and which bore the deceased's name. He appeared to be suffering from rheumatism. He was attended by Dr. Coates daily, and was in charge of Mr. C. S. Barter, house-physician. When I saw him first, on Sunday night last, he was affected by a pustular eruption on the face, his eyes were swollen and closed by erysipelas. I suspected the disease to be glanders, or farcy. Deceased's mother was questioned by Dr. Coates in my presence on Monday night, as to whether he had the charge of horses. She replied that he had. She was then asked if the horses were known to be diseased. She stated that two were diseased, but she could not state the nature of the disease. On the following day the boy's father came, and gave me the same account as the mother. I asked him if the horses were glandered, but he could not give me any definite reply. I told him to ascertain particulars and let me know. I have not seen him since. He

did not inform me whose horses they were. The boy died on Wednesday morning, at five minutes to one. The disease increased up to the time of his death, and extended to his arms and legs, and no remedies I could use seemed to arrest it. Glanders has always been a fatal disease. There is no instance on record of a person affected with it recovering. The disease is communicated by infection or contagion from the diseased horses. The snort of a horse had been known to produce it. It may be taken by any absorbent membrane, such as of the eyes and nose. Mr. Barter is sure to have taken a statement from deceased as to his occupation, &c.

The inquiry was then adjourned till Tuesday the 30th.

The inquest in this case was resumed last evening at the Guildhall.

Maria West, the mother of deceased, deposed that when taken to the hospital her son had then been ill for a week or eight days, and was not able to go to work; he was seen by Mr. Crang, of Timsbury. There was no eruption on him when brought into the hospital. I came to see him on Monday week, and remained with him till he died on the following morning. I did not know till after his death that it was supposed he died of glanders.

Joseph Crew, foreman of the smiths' works at Camerton Coal Works, said—I usually attend to the horses at the coal pit when they are sick, except in any serious case, when a veterinary surgeon is employed. I have been at the works twenty-two years. I know the glanders. We had a horse so infected about seven years ago; by my advice it was brought up from underground, and attended by Mr. Bazeley, veterinary surgeon, of Falkland. The animal was subsequently shot. That is the only case of glanders I have ever seen. The horse had a thick, continual, mucous discharge from the nose. I examined all the horses underground, nine in number, yesterday, and found them in a healthy state; the horses above ground are all healthy. There is no appearance of eruption on the horses. I have not heard of any diseased horses in the neighbourhood. A great many horses and donkeys come daily to the pit.

Richard Mullins, shoeing-smith at the new pit, Camerton, said—I see the horses under and above ground every week; and, as far as I know, all of them are healthy. I never saw a horse at Camerton with glanders, and I have been at work there ten years.

Mr. G. Feare, mining engineer, and agent to Mr. Jarrett, of the Camerton Coal Works, said—I have heard the evi-

dence of the witnesses; it is substantially correct, as far as I know. There are no horses diseased that I know of; if any were so they would be removed. I have never known glandered horses on the works since I have had the charge of them, from July, 1861.

Dr. Coates, visiting physician to the Bath United Hospital, said—Deceased was brought to the institution on the 17th September; the following morning I saw him. I was told it was a case of rheumatic fever. I found him complaining of the left shoulder, elbow, knee, and ankle of the same side. On making a careful examination of the shoulder I could detect no swelling or redness, but there was a slight blush over the knee and a slight swelling, and a deeper blush over the ankle. All the joints were exquisitely tender, and the skin hot and dry, the tongue coated down the centre, and red at the sides and tip; he complained of pain in the head, was somewhat dry, and not at all communicative; the bowels were confined, the urine highly coloured; he showed no disposition to sleep. There was no pain in the other side of the body; and as he had night perspiration and other symptoms of rheumatism, I put it down to be that disease, and treated him accordingly. The next day the symptoms were all more or less aggravated; on the 20th he was still worse, slightly delirious, and talked somewhat incoherently, and there was a blush over the right cheek; in the evening the blush had extended to the other side of the face, and involved both eyelids. On examining the surface of the body there were small eruptions, extending down both sides of the neck and arms and both lower extremities, but not on the body. The boy at that time was quite insensible, and with great difficulty roused; the tongue was much browner, and there was sordes on his teeth (a deposit indicative of typhoid fever); he was still worse. On the 21st the eruption had become distinctly pustular; the eyelids were so much swollen that they could not be opened. The red mark on his leg had evidence of matter, and he had one or two small abscesses on the neck and forehead, which were opened. He had now all the symptoms of typhoid fever, but no diarrhœa; he had low, muttering delirium; pulse small, feeble, and irregular. On the next day he was worse in every respect, the pustules still larger and harder, the face more swelled, the erysipelatous blush darker coloured, a yellow matter oozing between the eyelids, and a bloody, serous discharge from the right nostril; his pulse still more feeble and irregular. He was evidently sinking, and he died on the evening of the same day. It was only on the Saturday evening that glanders was sus-

pected, and I only came to that conclusion by a process of exclusion, that is, by excluding the symptoms of every other disease that I had knowledge of; and this disease answered so well to that described by writers on glanders that I had no hesitation in coming to the conclusion that this disease could be none other than glanders. Seeing the boy described as a miner, I thought it probable he might have charge of horses, and on making inquiries of the mother she told me he had care of some horses at the bottom of the pit, and this confirmed my suspicion. The evidence I have heard has not altered my opinion in the least, and I am still of opinion that the cause of death was glanders. Dr. Goodridge saw the case, and is of the same opinion. The eruption bears some resemblance to smallpox, but is larger, and no depression in the centre. I have never heard of glanders being engendered in the human subject; it may be so in horses, from living on board ship or in a confined place. I think there are one or two instances on record of persons recovering from chronic, but not from acute, glanders. Glanders chiefly affects the cavity of the nose; farcy shows itself in small abscesses running down the arms and legs. The matter of glanders will produce farcy, and that of farcy will produce glanders—the poison is identical.

The Coroner, in his summing up, remarked on the satisfactory nature of the evidence, which entirely exonerated the owners and those having the management of the pit. And though they had been unsuccessful in ascertaining whence the deceased caught the infection which caused his death, the inquest would not have been held in vain, if it made the public more alive to the exceedingly dangerous nature of the disease.

The Jury found that the deceased died of glanders; but how caught, there was not sufficient evidence to show.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

We have condensed the following from the reports of the meetings of the above association lately held at Cambridge, as being more or less interesting to our readers:

FOOT-POISON OF NEW ZEALAND.

Dr. Lindsay, F.R.S., contributed a paper on "The Foot-Poison of New Zealand," a plant which produced great mortality

among the cattle and sheep in that colony. It appeared that, though it had a poisonous influence on the human subject, it was not fatal to adults, but there were many cases in which children had died from eating the berries or other parts of the tree. The settlers had sustained serious loss by its ravages among their stocks of animals, and they said they would look upon the discovery of some antidote for the poison as one of the greatest boons which could be conferred upon them.

ON BREEDING "IN AND IN."

Dr. G. Child read a paper "On Marriages of Consanguinity," in which he stated his conviction to be that they are not opposed to some unknown law of nature, as contended by some persons—Dr. Darwin and others; that no such law in nature existed; and that, on the other hand, where ill effects were observed to follow upon these unions, they did so by ordinary inheritance only. The principal charges, he said, brought against marriages of blood were, that they were apt to produce sterility, idiocy, insanity, deafness, deformity, and scrofula. The question had been examined by both methods which were applicable to it, viz., that of observation and the statistical report of cases, and that of direct and extensive experiments in the case of the lower animals. The former was that upon which the view against the marriages in question were based, but it was liable to several sources of error, and he believed that the latter method was alone capable of affording satisfactory results. The results derived from experiments upon the breeding of animals, and the records of the 'Herd Book' and the 'Stud Book,' proved incontestably that many of the finest horses and horned cattle in England during the last hundred years had been bred with a degree of closeness infinitely greater than was possible in the human race. Mr. Child mentioned the case of a flock of sheep bred in and in for twenty years with perfectly satisfactory results, neither the breed nor the fertility of the animals having suffered in the slightest degree; and another case, related in the 'Herd Book,' in which one animal had served as the sire of four successive generations. In point of fact, the evidence derived from the breed of animals, against the hypothesis that the mere consanguinity of the parents had an injurious effect upon their offspring, was so unambiguous, and so much more conclusive than was obtained from observations upon mankind in its favour, that unless we were prepared to believe that the physiology of reproduction in the human race proceeded on laws altogether different from those by which that

union was governed throughout nature in the animal and vegetable kingdom, it might be fairly supposed to settle the question against that hypothesis. The Mosaic law gave strong though indirect inducement for marriages between blood relations, and that such marriages did prevail of old among the Jews was easily proved by passages in their history. It had been objected that the same kind of careful selection employed by the successful breeders of animals was not, and could not be, so used in the case of human beings, and hence the difference of the result which followed in the two cases. No doubt there was much weight in that objection, but it obviously proceeded on the hypothesis that the ordinary laws of inheritance governed close-breeding animals equally with others. Moreover, it was obvious that selection was just as much and just as little applicable to consanguineous marriages among mankind as to any marriages. Having referred to the case of a Highland clan in Scotland which had bred in and in for many generations without any deterioration in the race, and other instances of a similar kind, he arrived at the following conclusions :—1. That statistical evidence from observations of mankind was especially inapplicable to cases of this kind ; 2. That the evidence in favour of the theory that close breeding was against the law of nature was in the highest degree unsatisfactory; 3. That there is positive evidence from the results of recorded observation upon animals that no such laws affect them, *i. e.* that where other causes of degeneracy are absent, any degree of close breeding may exist without producing ill effects; and 4. That, unless we are prepared to believe in two distinct physiologies, the same must be true of the human race.

The Rev. H. B. Tristram, F.L.S., said that in one of the Bermudas there were only two families, and though intermarriage prevailed for generations, the people had not degenerated, and lived to great ages.

Dr. Paget thought that the objection to a union between cousins was well founded. Mr. Child had mentioned a flock of sheep bred in and in which were equal to the best Southdowns, but he seemed to forget that they were all a selected breed, and that if one lamb was not up to the standard it was killed or removed from the rest of the sheep. (Hear, hear.) Men and women were not like selected sheep. Everyone had some peculiarity, some weak point—it might be a tendency to gout or chest complaints, or some other defect of body or mind. A doctor could always point out some peculiarity or weakness in every family he attended. Suppose two cousins who had such a defect of constitution married,

the probability was that, by the very law of inheritance which Mr. Child supposed to be at variance with the popular notion, that defect of peculiarity would not only be inherited by the offspring, but be heightened and intensified. It was well known that genius was sometimes closely allied to insanity, and that the same nervous excitement which made a man clever in conversation and repartee might, if carried a little too far, bring him into a state in which it might be said he had a bee in his bonnet. He agreed that offsprings of first cousins need not exhibit any inferiority, but facts went to prove that there was a greater probability of defect in them than in the children of other marriages.

The President said that, though consanguineous marriages did not themselves produce disease, they were most inexpedient, inasmuch as they multiplied the chances of increasing and intensifying disease. He differed from those who said that there was nothing in human affairs corresponding with "selection," because they had overlooked the existence of managing "mammas." (Laughter.)

ON THE COLOUR-TESTS FOR STRYCHNIA, AND THE DIAGNOSIS OF THE ALKALOIDS.

Being the substance of part of the Croonian Lectures for 1861, *delivered at the Royal College of Physicians.*

By William A. Guy, M.B. Cantab., Fellow of the College, and Professor of Forensic Medicine, King's College, London.

(*Concluded from p.* 432.)

The last of the four questions proposed for solution in my first communication still remains to be discussed. It relates to the diagnosis of the alkaloids, and was expressed in the following terms:—Is it possible by means of the colour-tests, or by any simple modification of them, to distinguish the alkaloids from each other?

Before proceeding to examine this question, I must briefly refer to what I have already stated respecting the colour-tests. These tests, as commonly understood, are compound tests, consisting first of the reaction of the alkaloid with sulphuric acid, and then of the reaction of the peroxides of lead and manganese, the bichromate of potash, the ferricyanide of potassium, and the permanganate of potash, with the mixture of the alkaloid and sulphuric acid.

The sulphuric acid produces in strychnia no change of colour. Hence the acid itself becomes a test of no mean value. It serves, as I shall point out more particularly presently, to distinguish strychnia from a considerable number of the alkaloids, and also from several substances which give with sulphuric acid alone coloured reactions, some of which reactions with the acid alone bear a certain resemblance to those of strychnia with sulphuric acid *plus* the bichromate of potash, ferricyanide of potassium, permanganate of potash, peroxide of lead, or peroxide of manganese. In order to distinguish strychnia from other alkaloids, and from the substances to which I have just referred, it is essential that the sulphuric acid should be first applied to, and well mixed with, the strychnia, and that the absence of colour having been noted, the reagents that develop the colour should be in their turn applied. In all that I have said on the subject of the colour-tests for strychnia, and in what I have yet to say, I assume this mode of procedure to be strictly observed; and I shall continue to speak of these reagents as the colour-producing tests.

I have hitherto assumed that the sulphuric acid is applied *cold;* but I shall presently point out that we may greatly add to the value of this constituent portion of the colour-tests by first warming and then heating the acid solution. A very slight rise of temperature serves to develop very beautiful and characteristic colours in some of the alkaloids, while it does not change the colour of strychnia. A further rise of temperature, to the point of causing the mixture to give off vapour, develops colour in strychnia also, and deepens or changes the tints already imparted to the alkaloids previously affected by warming the acid mixture.

The colour imparted to a solution of strychnia in sulphuric acid, by raising it to a temperature at which it gives off vapour, is not strongly marked. It is a faint yellow or light greenish-brown, differing somewhat in depth of tint with different specimens of strychnia treated in all respects exactly alike. If the acid solution is allowed to cool, it no longer acts characteristically with the bichromate of potash or the other tests. Their action is wholly destroyed or greatly impaired. Hence, in applying the colour-tests for strychnia, we must use concentrated pure sulphuric acid, and use it *cold.*

So much for the first part of the colour-tests. We add to the alkaloid under examination sulphuric acid in small quantity—pure, strong, and cold; and it undergoes no change of colour. The alkaloid, therefore, whatever it may be, belongs to the class of which strychnia is one.

To this cold acid solution of the alkaloid we add a minute fragment of bichromate of potash, ferricyanide of potassium, permanganate of potash, peroxide of lead, or peroxide of manganese. The result is the remarkable development of successive transient, or short-lived, colours already described.

The negative reaction of strong cold sulphuric acid on strychnia, followed by the effect of heat on the acid mixture, and this by the peculiar colours produced by the application of the colour-developing substances to the cold acid mixture, constitute a series of phenomena which afford fair promise of proving the means of a successful diagnosis of the alkaloids.

To this work of distinction I now address myself, and in order to prepare the way more completely for the work of tabular analysis towards which the details given in my former communications have been tending, I must again revert to the question whether the action of the colour-tests on strychnia is, or is not, characteristic, and therefore diagnostic.

This is a question which must have suggested itself to every chemist engaged in medico-legal inquiries as of the utmost practical importance, and one chemist (Mr. Thomas E. Jenkins), having been employed to investigate a case of suspected poisoning in which the colour-tests gave indications of the presence of strychnia, very properly put the question to the test of experiment, by applying to a variety of active principles, including most of the alkaloids, first, colourless concentrated sulphuric acid, and then a fragment of a crystal of bichromate of potash. The experiments, which were carefully performed, and appear to have been strictly comparable one with another, embraced no less than fifty alkaloids and active principles, derived from the animal as well as the vegetable kingdom, and among them urea and uric acid, and cantharidine. More than half of these substances differed from strychnia in yielding colour when treated with sulphuric acid. The smaller half resembled strychnia in this respect. But not one of the whole fifty gave with the bichromate of potash the characteristic coloured reactions of strychnia. Feeling that my time would not be wasted in repeating his experiments, and, if possible, extending them to substances not included in his list, I possessed myself (partly by the kind assistance of Mr. Morson) of all the alkaloids and similar active principles which could be obtained, and tested them in the same way. To Mr. Jenkins's list, some of which I was not able to procure, I succeeded in adding as many as sixteen new substances. None of these gave the characteristic coloured reactions of

strychnia, nor any succession of colours any way resembling them, so that I am now in a condition to assert that strychnia stands alone among sixty-six analogous compounds in the reactions which it gives with sulphuric acid followed by the bichromate of potash.

Mr. Jenkins (as will be seen in the table published by him in the *Chemical News* for October 6th, 1860) arranges his reactions in two columns. The first column displays the effect produced by strong sulphuric acid; the second, the changes of colour caused by the addition to the acid solution of the bichromate of potash.

Now, this table affords an excellent illustration of the absence of method and logical arrangement. The substances operated on evidently took their places as they chanced to come to hand. Strychnia itself has to be sought out, and substances which give coloured reactions with sulphuric acid find themselves in contact with others that give a negative result.

And yet the table seems to court the attention of lovers of method and logical order. It is almost impossible to keep one's hands off it. At least, one would like to place the substances which are not coloured by sulphuric acid by themselves, and those that are coloured also by themselves. I have undertaken this work of tabulation, and, on inspecting the result, am seized with the same desire to resume the work of arrangement. In both groups there are substances which yield with bichromate of potash the same colours. Why should not these similar reactions be bracketed together? This, accordingly, I have carried into effect, and the result is a splitting up of the fifty substances into several groups of such moderate dimensions, that a man given to tabular analysis can scarcely resist the additional temptation to try whether some modification of the tests themselves, or some additional tests, or both together, may not lead to a successful separation and elimination of each and all the substances contained in the table.* I now proceed to lay before you in a tabular form the results of a very laborious experi-

* In the lectures given at the College of Physicians Mr. Jenkins's original table, and the two tabular arrangements alluded to in the text, were sent round. These tables were the more freely used as illustrations of a want of logical arrangement, as the author evidently did not aim at diagnosis, but only at the distinct ascertainment of the peculiar and characteristic reactions of strychnia. The remarks in the text were not, therefore, intended in any respect as a censure of Mr. Jenkins for not adopting an arrangement which, for his purpose, was unnecessary. I may add, that his table comprises several substances which will not be found in the tables I am about to submit. I mean such substances as the kinic and kinovic acids, and such animal products as urea and uric acid.

mental attempt to distinguish some of the principal alkaloids and active principles, whether derived from the vegetable or animal kingdom, from each other.

As the first object which I had in view was to distinguish the poisonous alkaloids and analogous active principles from each other, these substances are, of course, admitted into the tables; but I have added to these the active principles of many of our aperient medicines and common articles of diet; and have excluded only such of those substances as were so strongly characterised by colour or odour as not to be properly grouped with the colourless or faintly-coloured and inodorous alkaloids and active principles.* The table, divided for convenience into two, consists, as it is, of as many as thirty-five different substances, closely resembling each other in physical properties and chemical composition, and offering collectively a very difficult subject for tabular analysis. The tables, as you have them before you, are the result of a long series of experiments, and were only made to assume their present form after a great many experimental groupings and transpositions.

The first object which I had in view was to find some simple test which would divide the whole body of active principles comprised in the two tables into two principal groups. Concentrated sulphuric acid, as a constituent of the strychnia colour-tests, was obviously well adapted to this purpose. It has the effect of dissolving the alkaloids and active principles *without change of colour* in the case of one considerable group (Table I), *and with change of colour* in the case of another considerable group (Table II). The first group (Table I) comprises the majority of the active poisonous principles—strychnia, brucia, morphia; atropine, picrotoxia, aconitina; and the animal principle cantharadine. With these and several other alkaloids and active principles, some of which are very harmless ones, concentrated sulphuric acid either produces no change of colour, or a faint yellow-straw or buff tint.† I speak of *cold, concentrated* sulphuric acid, applied as in the preliminary to the colour-tests for strychnia.

* To this statement it will be seen that there are one or two exceptions, such as naphthaline, which, though colourless, has the odour of tar.

† I ought to state in this place that some of the alkaloids are very sensitive to heat, so that a very slight rise of temperature is followed by a decided development of colour. Hence it is possible that experiments made in a cold room in winter may yield results differing somewhat from the same experiments made in a warm room in the height of summer. It must also be borne in mind that sulphuric acid, if not free from nitric acid, may impart to some of the alkaloids a tint of rose, yellow or buff, sufficiently deep to justify the removal from Table I to Table II. It may be well,

The next object which I had in view was to subdivide these two large groups (Tables I and II) each into two or more smaller groups by some second test, which might also, perchance, produce in some members of the two groups characteristic reactions, so as to eliminate or separate them at once. For this purpose I tried the effect of warming the acid solution of the alkaloids by passing the porcelain slab through the flame of the spirit lamp, so as to raise the temperature of the liquid to a point short of that at which it gives off vapour. This subsidiary test answered its purpose completely; the group of substances in Table II, which had already given colours, more or less characteristic, with the cold acid, underwent further changes of colour, more or less peculiar; while the group in Table I, which had undergone no change with the cold acid, became subdivided into two leading groups, of which one continued without colour and the other underwent changes of colour more or less characteristic. In the instances of meconine and of aconitina, the colours developed proved to be peculiar to these substances, so as to lead at once to their elimination from the rest.

By raising still further the temperature of the acid solutions to a point at which vapour was given off, a further separation into distinct groups or classes was found to take place. The six substances which stand first in order in Table I still remained colourless, while the remainder assumed tints more or less characteristic. Esculine and atropine; picrotoxia, santonine, and narcotine; amygdaline and naphthaline, formed themselves into three distinct groups; while strychnia, brucia, and morphia gave indications of colour less distinct and characteristic.

By this triple test of sulphuric acid, *cold*, *warmed*, and *heated*, the active principles contained in this division (Table I) have been either eliminated or split up into manageable groups, awaiting the application of further tests. It seemed natural to select, as the next test in order, nitric acid—a known characteristic test of brucia and morphia. By applying this test to the several members of the table in succession, codia was isolated from the group of six to which it belonged by the distinct yellow colour assumed by the acid solution. Emetine was, in like manner, isolated from the other members of the same group of six, by yielding with the acid a yellow-brown colour. Atropine, again, was dis-

therefore, to state that the experiments on which the tables are founded were made in the winter, in a room with a fire, but in the morning, before the temperature of the room had been raised to a point approaching summer-heat; and that the acid employed was free from nitric acid.

tinguished from esculine by giving a negative result, while esculine assumed a distinct yellow colour. In the same way narcotine was detached from its group of three, and naphthaline from its group of two. Again, morphia was distinguished by the rich orange hue given by the acid, together with the red fumes of nitrous acid; and brucia was effectually distinguished from strychnia by the intense red of the former contrasting with the faint tinge of red imparted to ordinary specimens of the latter. For the next eliminating test I have selected sulphuric acid followed by a solution of permanganate of potash, in the proportion of 10 grains of the salt to ℥j of water. The effect of this test on strychnia was to develop its characteristic colours, strongly contrasted with the altogether different colours given with brucia, and still more with the brown colour imparted to morphia, followed by the bleaching of the liquid. This same test divided the somewhat unmanageable group of four at the top of the table (cantharadine and asparagine, and caffeine and cinchonine) into two small groups of two each. In the first two the immediate effect of the permanganate was a red-brown colour; in the second, a pink. Picrotoxia and santonine gave the same colour (pink), and remained undistinguished. The last and ultimate work of elimination was effected by means of heat applied to the active principle in its solid state. Cantharadine was found to be wholly dissipated by the heat of the spirit lamp, while asparagine gave a bulky carbonaceous deposit. And caffeine was found to present the same difference when compared with cinchonine. Lastly, picrotoxia was found to be distinguished from santonine by the bulky carbonaceous residue with the first and the scanty deposit of carbon with the second.

Having by this succession of tests obtained a clue to the active principle with which we have been dealing, we should proceed to identify the substance indicated by the table through its own characteristic tests.

In the second division of the one large table of elimination, or that which comprises active principles coloured by contact with cold sulphuric acid (Table II), the same succession of tests is employed. Cold, concentrated sulphuric acid at once separates this group of seventeen into eight smaller groups, of one, two, or six; and the subsequent warming and heating of the coloured acid solutions occasions such marked differences of colour as to nearly complete the work of elimination. But I have added columns showing the effect of nitric acid, and of the solution of permanganate of potash. The application of heat to the alkaloids themselves did not prove necessary to the work of elimination.

I submit these tables primarily as specimens of *Tables of Elimination*, but also incidentally as tables which may prove serviceable to the chemist. I am not certain that they constitute the best aid which could be devised to the diagnosis of the alkaloids. I thought that they might, perhaps, admit of being simplified by adding to the three columns headed "sulphuric acid" a fourth, showing the deposit of carbon resulting from the continued application of heat to the acid solution of the alkaloid. I tried this reaction in the case of fourteen alkaloids and active principles, comprising all the more active poisons of this class, together with the less important principles, emetine and meconine, and found the alkaloids to differ from each other in the amount of carbonaceous deposit. With strychnia, aconitina, and veratria, for instance, the deposit of carbon was less abundant than with brucia, morphia, atropia, and the other poisonous alkaloids. But the difference was not such as to justify me in using it as a diagnostic property. So also with the direct application of heat to the alkaloids themselves. Strychnia, morphia, atropia, cantharadine, meconine, picrotoxia, and delphinia, after melting, deposited but a scanty carbonaceous ash; while emitine, aconitina, and digitaline yielded an abundant ash; and brucia, elaterine, veratria, and solanine, yielded an ash intermediate in quantity. This test, again, though fairly applicable to the few cases in Table I, did not seem admissible as a diagnostic on a larger scale. Indeed, the tables, though carefully compiled and based on carefully conducted experiments, are open to the obvious objection that, with different specimens and different quantities of the alkaloids, and with different specimens of sulphuric acid, we may obtain differences of tint, and more or less ready development of colour under increase of temperature. The majority of the reactions, however, will, I believe, be found constant for all specimens of average purity. One alkaloid, hyoscyamia, which I was not able to procure, is omitted.*

Of the two tables, Table I affords the best illustration of a table of elimination. For the sake of brevity, and for other reasons already explained, the figures 1, 2, 3, are added to the words describing the colours developed by the tests. These figures indicate different degrees of intensity. In comparing strychnia with brucia, for instance, the figure (1) attached to the word "yellow" opposite strychnia in the third column means a faint-yellow colour, less in degree than that indicated by the figure (2) opposite brucia in the same

* In the lectures at the College of Physicians a table was used which showed the colours actually produced by the action of the several reagents on these poisonous alkaloids and active principles.

column. So the word "brown" with the annex [3] in the same column opposite esculine and atropine indicates an intense brown colour; the words red [3] and orange [3] in the column headed "nitric acid" indicate intense red and orange respectively.

TABLE I.—*Alkaloids, &c., giving no Colour with cold Sulphuric Acid.*

Alkaloids, &c.	Sulphuric acid.			Nitric acid.	Sulphuric acid, followed by the solution of permanganate of potash.	Heat.
	Cold.	Warm.	Hot.			
Cantharadine	0	0	0	0	Red brown	0
Asparagine	0	0	0	0	Red brown	Carbon[3]
Caffeine and Theine	0	0	0	0	Pink	0
Cinchonine	0	0	0	0	Pink	Carbon[3]
Codia	0	0	0	Yellow		
Emetine	0	0	0	Yellow-brown		
Strychnia	0	0	Yellow[1]	Pink[1]	Blue, mulberry, orange	
Brucia	0	0	Yellow[2]	Red[3]	Red, brown, orange, yellow	
Morphia	0	0	Brown	Orange[3]	Brown, then bleached	
Esculine	0	0	Brown[3]	Yellow		
Atropine	0	0	Brown[3]	0		
Meconine	0	Blue				
Aconitina	0	Brown				
Picrotoxia	0	Yellow	Brown	0	Pink	Carbon[3]
Santonine	0	Yellow	Brown	0	Pink	Carbon[1]
Narcotine	0	Yellow	Claret	Yellow		
Amygdaline	0	Pink	Brown	0		
Naphthaline	0	Pink	Brown	Yellow		

TABLE II.—*Alkaloids, &c., giving Colour with cold Sulphuric Acid.*

Alkaloids, &c.	Sulphuric acid.			Nitric acid.	Sulphuric acid, followed by the solution of the permanganate of potash.
	Cold.	Warm.	Hot.		
Veratria	Orange[3]	Scarlet	Claret	0	
Piperine	Orange[3]	Red-brown	Green[3]	Orange[3]	
Delphinia	Pink[1]	Pink[2]	Brown	0	Yellow[1]
Salicine	Pink[1]	Pink[3]	Claret	0	Claret
Digitaline	Red-brown[1]	Red-brown[2]	Red-brown[3]	0	Buff
Elaterine	Red-brown[1]	Red-brown[2]	Red-brown[3]	0	Pink[3]
Papaverine	Purple[3]	Purple[2]	Purple[1]	Yellow	Green; slate
Paramorphia	Purple[1]	Purple[1]	Purple[3]	Yellow	Green; brown
Quina	Yellow	Yellow	Yellow-brown	Yellow	
Aloine	Yellow	Yellow[3]	Green	Orange	
Jalapine	Yellow	Orange[3]	Red-brown	Yellow	
Narceine	Yellow	Red-brown[3]	Red-brown[3]	Green-brown[3]	Buff
Phloritzin	Yellow	Red-brown[3]	Red-brown[3]	Red-brown[3]	Pink[3]
Solania	Yellow[3]	Brown[2]	Brown[3]	0	
Cubebine	Pink[3]			Yellow	
Quinoidin	Brown	Brown	Brown	0	
Sanguinarine	Red-brown[2]	Claret	Claret	Red-brown[2]	

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

Journal des Vétérinaires du Midi, July, 1862.

CASE OF RUPTURE OF THE RECTUM—CURED.

By M. Vialas, Vétérinaire, Haute-Garonne.

An ox, the subject of this case, received a butt in the rectum from another ox while in the act of drinking at the river. On returning to the stable he was very uneasy, lay down and rolled himself on the litter, and as he got worse, M. Vialas was sent for. On his arrival he found the animal, a fine four-year-old ox of the Gascon breed, on his belly, with his head under the manger, as if suffering from violent colic. Having been informed of what had occurred, he examined the patient carefully. The pulse was small, frequent, and irregular; the muzzle dry, the respiration irregular, the rumen distended and full of food, the animal not having ruminated since the evening on which the accident occurred. He was further informed that the ox had neither voided any dung nor staled since the accident. On exploring the rectum, which was very hot, the bladder was found to be moderately distended, and in that part of the rectum which corresponds to the centre of the bladder a tumour was found, which was hot and very painful; anterior to it there was an accumulation of fæces, which the author removed, wondering why they should not have come away naturally. Returning to the tumour, which he had felt on the inferior surface of the intestine, he found in its centre a rent, into which he could introduce three fingers, after which some blood flowed. The edges of the wound were not thickened, and were about a centimètre and a half in length. The cowherd now confessed that he had explored the rectum after the introduction of the horn of the other ox at the watering-place, and that he also had found the rent.

Treatment.—Blood was abstracted to the amount of four litres, and injections of cold water every ten minutes, with a thin diet, were ordered. On the next day the colic had greatly decreased, the patient had ruminated at different intervals for about half an hour at a time, the pulse was not so quick as on the evening before, the muzzle was moist, the edges of the

wound were so much thickened that the opening could be scarcely felt. The fæces, which had accumulated, were again removed; the animal could not or was afraid to void them in the usual way. The cold water and diet were continued. A few days after all was well, and the ox was put to his usual work.

CRETACEOUS DEGENERATION OF THE HEART, HYPERTROPHY, &c.

By M. Herran, Vétérinaire, Landes.

In the month of March, 1861, the author was sent for to attend an ox, supposed to be very ill; but though he went immediately, he found the animal had died before his arrival. He at once made an autopsy. On removing the ribs a considerable substance was perceived in the anterior part of the thorax, which proved to be the heart; behind it was another organ, of a rose colour, shrunk, and very much wasted: this was the lungs. This latter, besides its general atrophy, had only the rudiments of its anterior lobes left; they formed two small, vascular appendages, scarcely an inch in length. There were no traces of inflammation in this organ; three tumours of a caseous nature were found, two on the right and one on the left, easily compressed by the fingers (crude tubercles). The pericardium was interiorly of a bright-red colour; the surface was rough and irregular, presenting a great number of eminences of various sizes, fewer at the base and apex, but numberless on the lateral surfaces. These eminences had attained the size of a lentil in some parts, while in others they were no bigger than a pin's head. In making an incision into these morbid products, it was found that they contained a nucleus in the centre, formed of calcareous particles, closely united, and of a receptacle or capsule enveloping the mass in such a manner as to connect it with the visceral coat of the pericardial sac, by means of a small peduncle or root, to a substance of the same nature enclosed in the tissue of the pericardium. This receptacle was formed by a fold of the serous membrane alone for the visceral layer, and by the serous and fibrous for the parietal layer. In both cases the membrane was thickened, but there were no traces of ulceration. A singular fact is that, with all these alterations of the subjacent serous tissue, the change of a colour and the thickening of the serous membrane itself, the pericardial sac did not contain one single false membrane; and there was hardly any more serum than in the normal state. The form of the heart was somewhat modified, the twist from right to left

had disappeared. Its weight was eighteen kilogrammes, nearly ten times the weight of the natural heart of the ox; its length was thirty-seven centimètres, and the circumference was in proportion. But the most remarkable feature was the tissue of the heart itself. On incising it the scalpel met with great resistance, and deviated from its proper direction through the varying cohesion and friability. On making a horizontal section there were seen, on a dark-purple ground, some small, yellow spots bearing some resemblance to calcareous sand. The vertical section presented these yellow points with more regularity; they were in a parallel line with the fibres of the heart. These productions were not in the same proportion in the structure of the heart; they were less abundant in the auricles, where they also were of a more granulated form, and isolated; next came the apex, and then the parietes of the right ventricle, in which they were disposed in short, interrupted lines, but were rather larger. The greatest alterations were in the superior third of the partition between the ventricles, particularly on the left side, on which the incrustations were so complete that in some parts no trace of the fibres could be perceived, their place being occupied by a hard, yellow substance which extended in lines or rays, decreasing in size and number as they proceeded further from the centre. There was no analogy between these deposits and those observed by M. Pigeaux in the human subject, and they were essentially different from the calculi or stones which are sometimes found in the heart of man. It appears evident, that this cretaceous substance was deposited by infiltration into the cellular tissue of the heart, and that afterwards in some parts the degeneration had invaded the fibres of the heart themselves. The interior of this organ showed no morbid alteration; the orifices, the valves, &c., were all in their normal state. The most important membrane of the heart had not participated in the alteration, which is no less remarkable from the foregoing description of the alterations in the pericardium. There was only a relative alteration in the large blood-vessels, which is easily accounted for by their situation and propinquity to the enlarged organ.

Next to these lesions must be placed those of the brain, the substance of which was softened; the yellow substance had lost its tinge, and could hardly be distinguished from the white. Both were of the consistence of thick gruel, and of a grayish colour. The choroid plexus was discoloured, and the arachnoid contained a quantity of serum. A livid colour and thickening were observed in the dura mater and the other membranes. In short, the brain was the seat of chronic

alterations. After these investigations the author felt all the interest which attached to the previous history of the case. Unfortunately the data furnished by the herdsman were very imperfect and of little account. He had only noticed a weakness and gradual loss of condition in the animal, the origin of which commenced about two years before. Moreover, the respiration became laborious, and the beatings of the heart audible after exercise, which it was often necessary to interrupt in consequence. Sometimes this would occur without any visible cause. That he had sought no professional advice on these occasions was because he considered the animal was labouring under pulmonary phthisis. The author enters into a further discussion on the difficulties encountered by the veterinary surgeon in the diagnosis of these affections in the lungs, &c., of domestic animals compared with the human medical practitioner.

Annales de Médecine Vétérinaire, Bruxelles, Juillet, 1862.

DROPSY OF THE UTERINE MEMBRANES OF A COW.

By M. Gérard, Médecin Vétérinaire du Gouvernement à Guaregnon.

The subject of this case was a cow nine years old, and about seven months in calf. She had previously had four calves without anything abnormal having occurred during gestation. She was off her appetite, drank but little, and that very slowly. On lying down, the respiration was difficult and plaintive; she grunted on being disturbed or on any one approaching or touching her. She had great difficulty in getting up, which she never did without coercion, but the weakness and great weight of her body prevented her standing up for any length of time. She would lie down immediately when not prevented. These facts were furnished by the owner. The symptoms, or morbid appearances, were an enormous distension of the abdomen to double of what it should have been in the normal state. The circumference was tolerably regular. There was, however, some deviation on the right side, and the spine, owing to the great weight, was also bent to the extent of one and a half centimètre. On examining the corresponding hypochondriac region, it offered great resistance on manual pressure, and presented a hard, unyielding mass; the skin, closely adhering to it, was thickened and corrugated, and but sparingly covered with hair, which turned in all directions. The flank, on the contrary, easily yielded, and conveyed the

sensation of a cavity filled with liquid; a hand placed on the opposite flank received a shock, produced by the displacing of the liquid. The decubitus was sterno-costal, generally on the right side, with only one of the fore legs under the chest, and that on the side she was lying; the other was extended; the same was the case with the hind legs, that on the left being raised from the ground by the distended abdomen. The head was extended, the mouth open, the tongue protruding, and at each respiration a short grunt was heard. It was only after repeated attempts that she succeeded in getting up. The standing posture was painful and fatiguing, and was only of short duration; while standing, the legs were far apart, more on one side than the other, the head still extended; when made to walk, she opened her mouth, protruded the tongue, grunted, and gave a peculiar motion to her ears, similar to that observed in vicious cows. The moving of the legs was very difficult, particularly the hind ones, and more so the right, which, on account of the enlargement in the hypochondriac region on the same side, had to move obliquely. If hurried, the danger of falling was imminent. On the right thigh there was an indolent tumour, which extended to the udder on the same side. The defecations were frequent; the fæces somewhat hard, bright, and small in quantity; the pulse 80, small, and hard; the mucous membranes pale, the muzzle cold, the ears and horns cold; grinding of the teeth; the movements of the flanks and the chest feeble. The skin on the abdomen and the chest was so tight that it could not be seized between the finger and thumb; there were rigors at the shoulders and thighs. The external examination being terminated, the author proceeded to the internal. By the rectum he ascertained that the colon had deviated to the right, and was maintained in that position by the superior part of the uterus, which had an oblique position from left to right, and from above downwards. The vaginal exploration discovered a displacement of the neck of the uterus. On reaching the end of the vulva it was necessary to carry the hand downwards below the anterior border of the pelvis and to the right; above was an enlarged portion of the uterus, which formed with the border of the pelvis a sort of pouch, the opening of which was elongated and narrow, and in which was contained the neck of the uterus. *Diagnosis.*—From the size of the abdomen the conclusion arrived at was that there was a collection of fluid in its interior, and hernia at the right hypochondriac region, into which the fœtus had descended. The deviation of the neck of the uterus confirmed this diagnosis, and led to the supposition that rupture, or at least a violent distension of the

broad ligaments of the uterus on the right side had taken place. By the rectal and vaginal explorations the organ which contained the liquid was finally determined upon.

Prognosis.—An account was given to the owner of the cow of the nature and gravity of the case, and the danger of an operation which afforded the only chance of relieving the animal; while, on the other hand, asphyxia, by the pressure of the diaphragm, would be unavoidable if an operation was not resorted to. In the one case was certain death, in the other there was some slight hope of saving the animal. The operation was determined on, and fixed for the next day. To ascertain whether the calf was alive, the right hypochondriac region was carefully examined, but neither to the sight nor touch was there any sign of motion; the conclusion therefore was that the fœtus was dead. The operation was commenced by endeavouring to dilate the os uteri. At the end of a quarter of an hour the author was only enabled to introduce the index finger up to the second joint. He endeavoured by a rotary motion to enlarge it, but without success. He then took a urethal catheter of Braguiez, which he introduced into the opening, making the same movements with it as he had with the index finger, and succeeded in overcoming the obstacle. He withdrew the stiletto of the catheter, but no fluid followed. He then discovered that the catheter was much bent in two places. After having straightened it carefully and reintroduced it, but with the same result, he again tried to dilate the os uteri with his fingers, and was now enabled to introduce the middle finger as well as the index. Upon again introducing the catheter without success, he came to the conclusion that he had to deal with extra-membranous dropsy. The catheter introduced served to direct the point of the stiletto, by means of which he now attempted to pierce the fœtal membranes. This was repeated several times, but without the slightest effect, except that about half a pint of fluid came out of the pouch formed by the border of the pelvis and the uterus. This contained a few flakes of a whitish colour, which were forced out by flexion of the hand, and afforded some hope that the section of the cervix might be avoided. On introducing the catheter, after having cleaned and carefully examined it, he moved it in every direction, but all in vain. He now allowed the animal to lie down, and again repeated the last manipulation, without success. He thus found himself forced to incise the cervix uteri, which he did with the bistoury, partly cased in tow to prevent wounding other parts. The incision was made in a downward and lateral direction, and was instantly followed by a violent gush of liquid, as

large as a man's arm. An attempt was made to collect the liquid in a tub, which was twice filled, and a third time three parts, to the astonishment of every one present. When the uterus was thus emptied, the author, having introduced his arm up to the shoulder, could feel the fœtal membranes and feet of a dead calf, which he proceeded to extricate. On tearing the fœtal membranes a viscous fluid escaped. Seizing the feet, which proved to be the hind ones, the calf came away with but slight traction. The uterus being thus relieved, the pressure on the other organs ceased, and the swolling of the abdomen subsided, but it had the appearance of an empty sac suspended from the loins. The hernia of the hypochondriac had become more apparent. The abdomen was separated from the thorax by a groove deep enough to insert the hand.

The subsequent treatment consisted in dry friction over the body, glysters, emollient injections into the uterus, alcoholic frictions on the tumefactions of the thigh and the udder, and tonic drinks. Soaked bread was ordered for diet.

On measuring the liquid collected, it was found to amount to sixteen pailfuls, holding together one hundred and sixty litres, besides what was lost before the tub could be put under it. Notwithstanding every care, the animal died on the third day after the operation.

On the autopsy the principal lesion was the hernia in the right hypochondriac region, the skin of which was thickened, and the cellular tissue gorged with coagulated blood, some of which was also found on the inside of the abdominal tunic. The aponeurosis of the obliquus abdominalis magnus and the obliquus parvus was ruptured, as well as the peritoneum, through which the right corona of the uterus had passed. These as well as the other parts were greatly increased in weight and size. There was a little effusion in the peritoneum of a sanguineous character. The uterus was of great weight when taken out, its colour was pale, its coats were considerably thickened. On incising them a transparent serum escaped; the cotyledons were enlarged and softened; the vessels were distended, and contained but little blood. The other organs were comparatively healthy.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD OCTOBER 30, 1862.

PRESENT:—The President, Professor Spooner, Messrs. Braby, Burley, Dickens, Ellis, Ernes, Field, Goodwin, Harpley, Hunt, Jex, Lawson, Moon, Robinson, Silvester, Wilkinson, and the Secretary.

The President, PROFESSOR SIMONDS, in the chair.

The minutes of the preceding meeting were read and confirmed.

The *Secretary* read a letter from Mr. Branford, M.R.C.V.S., Oundle, on the subject of a non-qualified practitioner having been appointed by the magistrates as an inspector of fairs and cattle markets, under the Act to prevent the spreading of contagious or infectious disorders among sheep, cattle, and other animals.

It was moved by *Professor Spooner,* and seconded by *Mr. Ernes*—

"That a committee be appointed, to consist of the following gentlemen, viz., the President, Messrs. Braby, Ernes, Goodwin, Harpley, Lawson, Moon, Spooner, and Wilkinson, to consider what steps should be taken with a view to publication, in consequence of the local magistracy having appointed parties who are not members of the veterinary profession to act as inspectors at fairs and markets, with a view to check the spread of epizootic diseases among animals."—Carried.

The *Secretary* reported that he had drawn the attention of Messrs. Kelly—publishers of the 'Post-Office Directory'—to the fact that the Royal College of Veterinary Surgeons was not noticed in that work; and he read a letter received from Messrs. Kelly in reply, in which they requested to be furnished with a list of members of the profession, to be inserted in conjunction with the notice of the College.

It was moved by *Mr. Ernes* and seconded by *Mr. Harpley*—

"That Messrs. Kelly be supplied with such information as they may require."—Carried.

It was moved by *Mr. Goodwin* and seconded by *Mr. Jex*—

"That, in addition to supplying Messrs. Kelly, the Secretary be empowered to send a notice of the Royal College of Veterinary Surgeons to such other publishing offices as he may deem necessary."—Carried.

The report from the Registration Committee having been submitted, *Mr. Wilkinson* proposed—

"That the amended Register be referred back to the Committee, with a recommendation that the Committee put itself in communication with Veterinary Surgeons in the several counties, intimating that the College purposes to publish a new edition of the Register, and requesting to be furnished with such information as will tend to make it as correct as possible."—Carried.

The House Committee next presented its Report, recommending

First, "That £20 be allowed the Secretary for servants' wages."

Secondly, "That the numbers of the *Veterinarian,* and the 'Transactions of the Veterinary Medical Association' and other works presented to the library, be bound and made complete."

Thirdly, "That the Curator of the Museum be supplied with all necessary requisites for preserving the specimens."

Fourthly, "That a clock be purchased for the Council-room."

The Report was received and adopted.

The Report of the Finance Committee was then submitted, recommending the continuation of the allowance of £50 to Mr. E. N. Gabriel for the ensuing year.

Professor Spooner moved the adoption of the Report, which was seconded by *Mr. Field,* and carried.

The Quarterly Balance Sheet of the Treasurer's account was read. The Balance in hand was £476 10*s.* 2*d.*

The Report was adopted.

The Inquiry Committee deferred the bringing up of its Report.

The Registrar reported that six deaths had occurred during the quarter, viz.: Mr. J. W. Nobbs, Cerne Abbas, Dorset; Mr. T. R. Lambert, London; Mr. W. Ryall, Horncastle; Mr. John Gibson, Manchester; Mr. Humphrey Whitehead, Trowell, Notts, and Mr. Joseph Osborne, Spondon, Derby.

Mr. Harpley having brought forward his motion for the alteration of Bye-law 27:

It was moved by *Mr. Harpley,* and seconded by *Mr. Lawson*—

"That the alteration of the time for examination be acceded to according to the notice suspended in the Board room."

It was afterwards moved by *Mr. Wilkinson,* and seconded by *Professor Spooner*—

"That this matter could not be discussed at the present

meeting, it not being specially convened for the purpose; and that it must therefore stand over for a special meeting."—Carried.

On the motion of *Mr. Ernes* for the next examinations,

It was Resolved—"That the examination of Candidates for the Diploma of the Royal College should take place within the fortnight preceding Christmas-day."

Cheques were ordered to be drawn for the current expenses of the quarter.

By order of the Council,
W. H. Coates,
Secretary.

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

The members of the West of Scotland Veterinary Medical Association met on the 4th November, in the Glasgow Institution room, Cathedral street,

Mr. Dunlop, President of the Society, in the Chair.

The minutes of the previous meeting were read and approved of.

Mr. Adam C. Robertson, V.S., Airdrie, and Mr. Alexander Brechenridge, V.S., Holytown, were proposed, balloted for, and admitted members of the Association.

The *Secretary* gave notice that, at the next meeting, he would propose that this Association do agree to protect its members against legal proceedings from any supposed want of professional skill in the treatment of animals committed to their care, or any presumed neglect on the part of their agents or servants. He said that the profession nowhere could be in a better position for adopting such a proposition than in the west of Scotland, seeing that almost all the members are connected with this Association. In many parts of the country, where such a movement was desired, a society required to be originated for the purpose of carrying out the object; but here we are organized already, and united in our efforts for the advancement of the profession; we have also a considerable sum of money in the bank, and, in fact, are in every way able to protect any of our members against unlawful and unreasonable persons, who compel us to appear at times in court to answer charges

which, to say the least of them, are altogether unjust, and which tend too often to injure the honest practitioner more than can be well known. He hoped, therefore, that when this important matter came before them at their next meeting they would give it full consideration.

Mr. Anderson proposed that the Committee meet eight days before the annual meeting in December, for the purpose of arranging the Society's special business at that time.

The *Chairman* then called upon Mr. Dobie, of Irvine, to read his paper "On Paralysis in the Horse." But it having been read by him at a former meeting, he adverted to the particular points orally. These were afterwards fully discussed by the members. Mr. Dobie's paper is subjoined.

ALEXANDER POTTER,
Secretary.

ON PARALYSIS IN THE HORSE.

I HAVE chosen paralysis in the horse as a subject for discussion, it being a disease which perplexed me not a little in two cases in particular which I have met with. I therefore bring this subject before you, so that I, and perhaps others who may be younger in the profession than myself, may be benefited by the discussion likely to take place by the more experienced amongst us.

General paralysis is a disease known by the loss or diminution of the power of voluntary motion. It may affect certain parts of the body, each part affected having its own name, as paralysis, partial or complete, of some particular muscle; paralysis hemiplegia, one side of the body; paralysis paraplegia, one half of the body taken transversely, &c.

General paralysis in the horse we find described in some of the numbers of the *Veterinarian* as arising from the eating of partially ripened rye grass, and it is believed by some to arise from some narcotic or paralysis-producing principle in the rye grass when in that state. But I would ask, may it not result from merely the eating of too much, thus causing derangement of the digestive organs, and subsequently interfering with the flow of nervous power from the brain to the organs of motion? I am inclined to think this, as I have been called to treat similar cases during both winter and summer, and when I was assured that the animals had been fed on good corn and hay, but were perhaps idle, and, at the same time, gross feeders.

These cases of paralysis, arising from the eating of rye

grass, are common, I believe, in most parts of the country, and generally easily treated by giving a laxative and altering the diet; the changing to old hay or straw in many instances being quite sufficient to restore the animal to health. By this, time is allowed the organs of digestion to regain and perform their proper functions, as it is but seldom that an animal will at once eat too freely of dry food after he has been fed on green.

I have occasionally met with paralysis paraplegia during winter. In some cases the owners have confessed that the horse had slight general paralysis or grass staggers during the summer, but they had taken little notice of it, as, perhaps, the animal was not working at the time. The master expecting the animal to recover without medical treatment, the feeding even had not been changed, and the disease had lingered on till the system became relaxed and enervated, so much as to cause danger of falling when the animal was backed in a cart or walked on a rough field. In these cases I generally give a purgative with calomel, and then tonics and stimulants.

I have said that we have paralysis arising even when horses are fed on corn and hay, to prove which I will give the history and treatment of two cases that came under my notice. The first was a brown carriage-horse, six years old, the property of Mr. Ralston, of Warwick Hill. On the 3rd June, 1859, I was called to attend him, the coachman informing me he had been unwell all night, and had been down once or twice. When I arrived I found my patient quiet and dull, pulse natural. From his movement in the stall I observed a swinging action, and therefore had him led out, which convinced me that I had derangement of the digestive organs to deal with. I gave a physic-ball, which operated well, and in two days after the horse appeared all right, and was put to work.

On the 8th I was again called to attend my old patient at Irvine. He had taken the carriage there all right, a distance of about four miles, and was stabled at an inn; but when required for the carriage again, he was found unable to walk. When I arrived I found him worse than before; more dulness, severer paralysis, the head drooping a little, and the pulse rather oppressed. With difficulty I got him led to a loose box, put a rug on him, and gave a laxative draught, followed by a clyster. A few hours after he took a mash, and at times a little hay. Next day the bowels acted slightly, but there was little improvement in his walking. I ordered a sheepskin to be put over his loins, and boiled barley and mashes be given him to eat; two days later, only little improvement had taken place. I now applied a mustard poultice

along the spine, and gave tonic medicine daily; but finding my patient not improving as fast as I wished, I purposed to try strychnia, but desired the consultation of another veterinary surgeon. The proprietor consenting, Mr. Aitken, of Kilmarnock, was informed of it, and a time was fixed for us to meet, but unfortunately he did not get there till ten hours after, so that I had left. His opinion and orders were to take the horse home, turn him out to grass, and give a feed of corn daily, assuring the owner that he would be ready for the carriage in six weeks. To this I would not agree, and Mr. Aitken was again called in to meet me; but the second time was like the first. In a few days the horse was taken home, turned to grass, and attended to by Mr. Aitken. The animal got powders daily for a time, and was twice severely blistered along the spine. However, six weeks passed, and even many more, and the horse was still unfit for work, even on the farm.

February 9th, 1860.—I was again sent for to see the horse, and requested to take and treat him, or, if I thought he would not recover, to destroy him. I had him brought to my place with difficulty, as he threw his legs about as if they did not belong to him. I first gave a dose of physic, and then commenced with strychnia, giving it in one-grain doses twice a day, made into a ball with ginger and gentian, and increasing the strychnia one grain daily till he had given him six grains at once. Two hours after this dose I entered the stable quietly; he sprang forward in the stall with his head in a corner, blowing, and in a fearful state of excitement, scarcely able to steady himself, his back arched and tail erect. I remained about two hours pacifying him, which he seemed fond of; but when anything stirred he was again thrown into a sort of tetanic spasm. Next day he was led out, and I fancied him much better. The strychnia was gradually reduced to two grains per diem, and I allowed a few days to pass without any. I now gave exercise daily in a field, and again commenced with strychnia as before, till he had got two six-grain balls. Two hours after he got the last I was surprised to find him on his broadside, smashing desperately and unable to rise; and I again tried to pacify him, which kept him much quieter, although at times severe spasms came on. In less than two hours he rose and seemed all right, with the exception of a few abrasions. The medicine was again reduced gradually, and exercise increased. I could now run him across a ploughed field with safety. Once more I increased the strychnia till he got twice seven grains, the last dose bringing him on his broadside as

before. But I found him much better after each attack. I now gave him exercise, and could ride him. Mr. Ralston having his place filled up, he was sent to a friend's, where he now works regularly, and runs in the dog-cart when required. Nothing has since been seen wrong with him.

The second was a three-year-old filly. My attention was called to her at the latter end of August, 1861; she was then rocking in her walk, and throwing down her feet as if she had no feeling in them. The owner informed me she had an attack of staggers in the month of February, and had been in that state ever since. On asking for a further history of the case, I was informed that she was a greedy feeder, and was standing in the house during the frost, getting as much as she could eat, in order that she might be the more able for work in the spring. When seized with staggers, she was bled and physicked by a veterinary surgeon, when she fell down and lay for some days. The paralysis not leaving her, she was turned to grass, but was getting no better. I had her brought to my place, and treated her with strychnia as the former case, but brought her only once under the poisoning effects of the agent. She, however, got eight grains before its action became marked. It was then reduced, and again gradually increased to ten grains and reduced, but here I stopped, as she was very troublesome to give a ball to. She was sent home a good deal better, and able to work, but the disease not altogether removed. Thus I am of opinion that we may have paralysis following derangement of the digestive organs, either from the overloading of the stomach with rye grass or any other food, and that we have a useful medicine in strychnia for its treatment.

Veterinary Jurisprudence.

FARNHAM COUNTY COURT, Nov. 12th.

(*Before* J. F. Fraser, Esq.)

KIMBER *v.* GODWIN.

This was a claim of £4 for loss alleged to have been sustained through the defendant's misrepresentation in the exchange of a cow.

Mr. Pain appeared for the defendant, who is a farmer, residing at Fleetpond.

The plaintiff, who is also a farmer, deposed that, on the 9th of July last, he sold the defendant a cow for £12 at Crookham Common, and

purchased another of him on the same day for £9. The defendant said the latter cow kicked at milking, but was otherwise quiet. This was the misrepresentation complained of. The plaintiff added, that on hearing this from the defendant, he replied that he did not care about her kicking at milking; and he then purchased the cow, and took her home.

Cross-examined—We were afterwards in danger of our lives; she drove at a score of us. There was no conversation about the cow beyond what I have stated, neither was any warranty given. We had a difficult job to get her along. The cow was not represented to me as being wild. My son and myself led the cow by a halter. I kept her four or five days, and was then obliged to kill her, because she was so wild. I sold her to Mr. Mattingly, butcher, of Farnham.

A witness, named *Ely*, said he believed the cow was mad. He had seen her attempt to gore the defendant, and on one occasion it took three men to milk her.

Another witness, named *Prior*, gave similar evidence.

Mr. Pain contended that the animal was quiet, and would have been easily driven home, but that the plaintiff had tied its head to a fore leg, and goaded it so much as to drive it into a state of madness.

His Honour observed that in such a case it was high time the animal should be killed.

The defendant and a witness were called, and they endeavoured to prove that the cow was quiet, except sometimes on being milked.

Mr. Mattingly, butcher, was sent for, and he deposed that at the time he bought the cow of the plaintiff she was in a wild state, so that no one could with safety get near her. He thought the vicious habits of the animal were natural, and not produced by being drawn from Fleet-pond with her head tied to a fore leg.

Mr. Pain asked for an adjournment, with the view of producing further evidence in support of his case; but his Honour declined, observing that, in his opinion, the animal ought not to have been sold to anybody.

Judgment was given for the plaintiff, with costs of two witnesses.

MISCELLANEA.

A MILITARY veteran has just died full of years and honours. His name was "Dob," and he had four feet. In plain English, he was a noted war-horse, who entered the service October 2nd, 1833, and served in the Crimea. He was in the charge of Balaklava and the battles of Alma and Inkermann. Having grown old in the service, the Duke of Cambridge would not permit him to be dismissed, but ordered him to pass the remainder of his days in peace and plenty, fighting his battles over again to admiring equine companions.

OBITUARY.

Died, on the 15th of November, aged 42, after a long and painful illness, Mr. George Cooke, M.R.C.V.S., manager at King's, late Plews and King's, veterinary establishment, Newcastle-on-Tyne. He was much and deservedly respected. His diploma bears date March 31st, 1841.

DEATH OF MR. JONAS WEBB.

The death of so distinguished an expounder of the principles of science in the breeding and rearing of animals, and so justly respected a man, as Mr. Jonas Webb, calls for a record in the columns of most periodicals, but especially in such an one as ours, connected as it is with the interests of both agriculture and veterinary science. We had scarcely realised the fact that death had entered his happy and hitherto united family circle, and had removed the beloved partner of his life, when the mournful intelligence spread, as on the wings of the wind, that he also was no more. Mrs. Webb, who for some time had suffered from impaired health, and who was no less and deservedly appreciated than himself for kindness of disposition and sincerity of friendship by all who had the happiness to know her, had, on the advice of her physician, taken up a temporary residence, for change of air, with her brother, Mr. H. Marshall, of Cambridge. Here she became suddenly worse, and died after a few days of severe illness, on the 5th of November, the anniversary of her son's birthday, and the one also which had been fixed for his marriage. The alarming character of his wife's attack proved too great a blow for poor Webb, who immediately took to his bed in the house of her brother; and when he realised the fact that all hope of his wife's recovery had passed, he gradually sank and died, only five days afterwards, on the anniversary of his sixty-sixth birthday, and the very one also on which she was buried. It is not too much to say that Mr. Webb's fame as a breeder of Southdowns has spread throughout the world. All men did homage to his ability and success in perfecting the form of animals, and in rendering them capable of arriving at early maturity. We purposely refrain, however, from entering into particulars of his efforts, or the history of his flock, believing that no better proof of our sincere regret at the loss the country has sustained, and of our reverence for his memory, can be given than by reserving them for a future occasion. Peace to his manes!

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